THE IRON AGE

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Iron and Steel Exports Keep Up

Large Tin Plate Order for the Oil Trade

Better Demand Expected from the Railroads, but Buyers Generally Hold Off

Export business in steel products has been unusually good of late, excellent as it was throughout 1910, and it is particularly welcome in the present halt of new demand at home. A significant order recently placed is for 250,000 boxes of tin plate for the export oil trade. Welsh tin plate, as is well known, has long been imported for this trade, but the crowded condition of Welsh mills and the consequent advances in tin plates abroad have temporarily thrown the business to American mills.

Another phase of the heavy export trade now coming to the United States is the inability of British manufacturers of plates, angles and shapes to take their usual share of the foreign trade in those lines. The ending of the British shipbuilding strike and the large accumulation of new work at the yards will call for all the ship steel British mills can deliver for several months. The result has been the turning of considerable inquiries from neutral markets to this country. Exports to Canada have kept up well; a recent order is for several thousand tons of structural material for a bridge over the Saskatchewan.

The meeting of steel manufacturers in New York this week is seemingly the pivot of the market; at all events it is the latest reason given for the holding off of buyers. Steel manufacturers are represented to be practically unanimous in favor of holding prices as they are, in view of the decline that has already taken place from the 1907 level, and the belief that there is no dammed up demand which lower prices would release.

Little has developed since the opening of the year to throw light on the ultimate outcome of the present situation except the better prospect for American steel abroad. Those who believe that the present price basis will be substantially maintained, not only temporarily but ultimately, count much on a larger railroad demand than has thus far been indicated for 1911.

From the railroad standpoint the immediate situation is considered to be better to the extent that 220 locomotives have been placed in the past week and that rail and bridge demand shows more promise. The acceptance of the Pennsylvania rail order for a total of 150,000 tons has been assured by an agreement on the price to be paid for the extra discard. The basis of the New York Central contract is also near adjustment, an extra price being asked by the mills for meeting the ductility requirements on high carbon open hearth rails. The Great Northern has bought 3800 tons of open hearth rails and an Eastern coal road with Western connections has bought 16,000 tons. An inquiry for 28,000 tons for a Western line and one for 25,000 tons for a Southern road are pending. The Gary rail

S. DIESCHER & SONS,
Mechanical and Civil Engineers,
PITTSBURGH, PA.

mill will start up next week, having orders for 20,000 tons for early rolling.

A favorable construction has been put in some quarters on the fact that the Steel Corporation's figures for orders unfilled December 31 showed a smaller decline in December than in November. Such a conclusion would be better founded had not both new orders and mill output been less in December than in November.

More inquiry for Southern pig iron is reported, but the $11 Birmingham basis has been shaded 25c. or more on analysis iron equivalent to No. 2. In the East the slackness in the textile trade is reflected in the curtailment of forces by foundries and machine shops manufacturing textile machinery. The extent to which the business contraction is affecting foundry operations is a factor in the situation which pig iron producers are watching closely.

Two eastern Pennsylvania blast furnace companies announce a 10 per cent. reduction in wages. This action follows several months of pig iron prices on which Eastern makers have barely made their cost.

Chicago opened bids this week for 10,000 tons of water pipe, the leading producer being low bidder at about $24, delivered, for 12 to 48 in. sizes. Pipe foundries have had some good inquiry of late from gas and water companies for their spring requirements.

Copper has declined ¼ cent in the past week, electrolytic now selling at 12½ cents, while lake is only nominally 12.75. There has been some fair buying on the decline.

The Steel Corporation's Output in 1910

The United States Steel Corporation made new records in the production of pig iron, steel ingots and rails in 1910. In pig iron and steel ingots this is but paralleling what was done by the country as a whole. Not so with the record in rails, for the independent mills did not approach last year their record total of 1906, when the output of the United States was 3,977,872 gross tons of steel rails. It is a safe estimate that the total of 3,023,845 tons in 1909 was exceeded last year, but not greatly. The Steel Corporation is understood to have produced more than 2,000,000 tons of rails in 1910, while its best previous record was 1,982,042 tons in 1906.

The pig iron production of the Steel Corporation last year, approximately 11,800,000 tons, is nearly 200,000 tons in excess of the best previous year's record, that of 11,618,350 tons in 1909. The statement of the pig iron output of the country in the past six years is given below, with the output and percentage in each year of the Steel Corporation. It shows that last year's percentage was less than in any year of the six, except 1907:

Pig Iron Production in 1905-1910.—*Gross Tons.*

	Total for United States.	Steel Corporation.	Per cent. Steel Corporation.
1905	22,992,380	10,172,148	44.2
1906	25,307,191	11,267,377	44.5
1907	25,781,361	10,819,968	41.9
1908	15,931,018	6,934,408	43.5
1909	25,795,471	11,618,350	45
1910	27,275,000*	11,800,000	43.2

* Estimated.

The Iron Age's monthly pig iron statistics for 1910 and 1909 show that the steel companies made 18,062,329 tons of pig iron in 1910, against 17,036,285 tons in 1909, an increase of more than 1,000,000 tons. The increase of the independent companies was thus more than four times that of the Steel Corporation—accounted for in part, no doubt, by the fact that the Steel Corporation drew upon its pig iron stocks to a greater extent than its competitors.

The steel ingot production of the Steel Corporation was well beyond all records, exceeding that of 1909 by nearly 800,000 tons and that of its record year in steel, 1906, by 640,000 tons. A comparison with the production of previous years follows:

Production of Steel Ingots and Castings in 1905-1910.—*Gross Tons.*

	Total for United States.	Steel Corporation.	Per cent. Steel Corporation.
1905	20,023,947	11,995,239	59.9
1906	23,398,136	13,511,149	57.8
1907	23,362,594	13,099,548	56
1908	14,023,247	7,838,713	55.9
1909	23,955,021	13,355,189	55.7
1910	.....	14,150,000	...

If the steel ingot and castings production of the country in 1910 should prove to have been 25,000,000 tons, as the increase in pig iron production of the steel companies and the Steel Corporation's ingot increase would seem to indicate, the Steel Corporation's percentage would be 56.6, or slightly more than the average of the three years previous.

To Amend the German Patent Laws

The German Government proposes radical changes in its patent laws, through the medium of a bill recently introduced in the Reichstag. While only meager details have been received here, the understanding of patent attorneys who have kept in touch with the situation in Germany is that the amendments, directly or indirectly, will take from the American patentees their singularly advantageous position in that country, as an answer to the protest that has gone up from German manufacturers and inventors. Under the existing agreement with the United States, the American patentee in Germany is exempt from the provisions of compulsory working, which holds with citizens of all other nations and with the Germans themselves. The treaty was made with the idea that the American laws were soon to be amended to include the compulsory working principle, which, however, has not been done, nor does such action now seem imminent, though it has many strong advocates. Naturally the Germans believe that the Americans have altogether the best end of it, though there is justice in the argument that while patentees of other countries are not compelled to work their American patents, that burden should not be imposed upon Americans in those other nations.

Undoubtedly the German Government has, as the most essential reason for the amendments, the wish to place its laws nearer the basis of those of other European countries, notably Great Britain. The British patent act has hit the Germans very hard. The bill, according to information received, provides the right to rescind a patent after three years in case the invention has been worked chiefly outside of Germany. Another provision would give the Government the power to compel a patentee to license another person to manufacture under the patent, should he not make use of it himself. Apparently the purpose of the legislation is to strengthen greatly the existing laws.

The Growing Use of the Industrial Automobile

The growing use of the industrial automobile is attracting attention in the metal working industries, not only because the increasing manufacture of auto trucks opens an excellent market for material and mechanical equipment, but also because of their adaptability to the requirements of manufacturing plants. For some years auto trucks have been gaining favor with the railroads and steamship companies for the transfer of baggage, and their use as a delivery medium by express companies and mercantile houses is becoming quite general. The adoption of auto trucks as part of the interior transportation systems of plants is a more recent development, and their use in that direction is growing. A number of manufacturers of mechanical equipment, including a large pneumatic machinery manufacturer and a gas engine building company, have recently begun the manufacture of auto trucks for this special purpose. Unlike most makers of self-propelled commercial vehicles, they did not take up the manufacture of industrial trucks as an adjunct to pleasure cars, but they entered the industry because of the possibilities it offers as a distinct enterprise. Under certain conditions the auto truck has its advantage over industrial railroads for use in factory plants. It affords a flexible carrying system, as a truck can be guided in and around a congested plant to pick up a load, while with a railroad in use the freight must be brought to the tracks.

There are now 100 auto truck builders in this country, as against one-third of that number four years ago. Many firms now in that line make industrial cars exclusively, and the type of low bodied trucks most adaptable for factory use is growing in favor. The increasing use of industrial vehicles is creating a call for material and machinery used in its manufacture that is in a measure making up for the decreased buying on the part of makers of pleasure cars. It is safe to assume that the possibilities of the auto trucks have not by any means been reached and the industry promises to be one of no small importance.

The Conservative Copper Market of 1910

Fluctuations in prices on both lake and electrolytic copper during the year 1910 were far less erratic than in previous years and the effect of speculation on the market was felt but little. Only once during the year did the New York quotation on lake copper go beyond 14 cents, and that was in January, when, because of a heavy demand for prompt shipment 14⅛ cents was asked. The lowest price made on lake during the year was in July, when lots from second hands were offered at 12⅝ cents. Thus it can be seen that there was not 2 cents a pound difference between the high and low price. It is to the credit of the sellers that no strong attempt was made to force the market upward at any time, but it was allowed to advance or recede according to the strength of the demand. There have been times in other years when the consumer of copper had been the plaything of the speculator; hence, last year's record was a creditable one to the trade. Whether the publication of the monthly statistics of the Copper Producers' Association contributed toward conservative trading it is hard to judge, but certainly the market during the year in this country was less sensitive than that of London and was conducted on a more stable basis.

An Essential Cost Factor of Compensation

An element of workmen's compensation, little understood though of great moment, is the wide variation in cost to the employer, dependent upon the period of time following an accident during which no compensation is paid. Under all employers' rules governing the system, a certain period must elapse before the injured employee may begin to receive damages. In some cases it is a week, in others two weeks. A compilation prepared by an expert in employers' liability, based on the history of hundreds of accident cases, reveals the fact that, while with a one week limit 34 per cent. of industrial accidents produce disability enduring more than one week, the number is reduced to 20 per cent. when the limit is extended to two weeks. This means that a great number of injuries compel the victim to lay off more than seven days but less than 14 days. In the attempt to guide legislation in order that the proposed compensation laws of various States may be just to both the employer and the employee, these significant figures should be kept in mind. It will make an enormous difference in the cost of the system to the employer if he has to pay damages for 34 instead of 20 out of each 100 accidents.

Septic Poison's Needless Cost in Works

Some large employers of labor are giving careful consideration to the education of their working people, with a view to reducing the number of disabilities resulting from blood poisoning caused by negligence or ignorance in the care of injuries. It has been found that 10 to 20 per cent. of disabilities—depending on the nature of the employment—are absolutely unnecessary. If these cases were originally attended to properly, the wound would heal quickly, with little inconvenience to the sufferer. As it is, the workman disregards a slight trouble, such as a superficial cut, and in due time finds himself a victim of septic poisoning. A seeming trifle develops into a serious matter. Where compensation exists, the great number of these cases becomes an expensive burden to the manufacturer. Without regard to financial obligation, it is often costly to have men absent from their regular places, because the routine of production is disturbed. This species of disability is by no means confined to the more ignorant classes of labor. Men generally have a contempt for small ailments, often failing to realize their possibly serious and even dangerous consequences. The suggestion is made that all employees receive printed warnings of the danger of septic poisoning from slight wounds or abrasions.

Correspondence

The Value of System

To the Editor: The recent declaration of the wasteful methods of American railroads by Mr. Brandeis have done more to bring public notice to the industrial engineer than all the other discussions that have been held for many years. We are confronted to-day with the beginning of the interesting spectacle of the business world "house cleaning."

It may be well to attempt to define the one word that

is commonly used to describe the activities of the industrial engineer—"system." That word or term may be defined as a method or order of accomplishing a given task. Almost everybody who has paid any attention to the progress of the world knows of the word, and its meaning, but, strange to say, the application of system to commerce and industry in this wonderful industrial nation is comparatively recent. In the early days of American railroads, when these systems of transportation were first stretching out their important branches, the main issue was their economic construction. Now we have come to the period when economy in operation is demanded, and to the time when it is necessary to economize on the cost of labor, as the chief item of operation.

This same condition also extends to and embraces every line of American industry. If we observe the conditions among the 3 per cent. of manufacturers who have now come to recognize the real value of scientific plant management—another way of saying "system"—we find that not only has system increased their production, but it has brought about an increase in the value of the assets that invariably follow, and in the 97 per cent. of manufacturing plants that have not installed any system worth mentioning, we find old-time, slip-shod methods, the pitiful spectacle of a heavily handicapped business, and in not a few instances a closed factory or a commercial failure.

Many people have dilated at great length upon the harmful effect of modern combinations of business men, but few have spoken of the great lesson in the elimination of waste which these same corporations or combinations have given us. The direct aim of the great combination may be explained in two fundamental principles—namely, to manufacture or purchase at the least possible cost, and to sell at the highest price consistent with good business principles. If we take any of the existing combinations of business men into one corporation we immediately abolish a great number of presidential offices, &c.; thus we are reducing the cost of labor to the minimum of value, and bringing about a greater sense of efficiency by concentrating our activities and the responsibility for their outcome. While many such combinations have undoubtedly become dangerous, it will serve us well to take their lesson of the value of "system" into serious consideration for application to our national and local efforts at regulation of the dangerous activities of the same combinations. This indicates the true value of uniformity, or a standardized system for the nation as a whole, becaus 90 per cent. of the industry of the United States is officially clasified as Interstate. The preponderence of Interstate over State or foreign commerce virtually eliminates the possibility of success in regulating its factors by diversified action of all the States in the Union.

It would not be a bad way of concluding my comments on the present and future value of "system" by quoting a statement attributed to Andrew Carnegie some years ago: "Take away all our factories, our trade, our avenues of transportation, our money, leave me our organization and system, and in four years I shall have re-established myself."

MICHAEL J. HICKEY.

BROOKLYN, N. Y., January 5, 1911.

The New Orleans Roofing & Metal Works, New Orleans, La., announces that Edgar A. Fordtran has acquired an interest in the company, and the property is now entirely controlled by Mr. Fordtran and A. S. White. Mr. Fordtran is a native of Texas, and was for 11 years or more secretary, treasurer and business manager of the Galveston *Tribune*. The business of the New Orleans Roofing & Metal Company was started 13 years ago by Mr. White, and grew to such proportions that three years ago the present large plant at Scott and St. Louis streets, on the line of the New Orleans Terminal Company, was built. It covers a square. The company owns an adjoining square not yet built upon. Its products are shipped all over the United States, Central America and Mexico, comprising decorated and lithographed cans; also corrugated iron, metal shingles, stove pipes, &c. The plant is equipped with the latest improved machinery, and employs 150 hands.

New Publications

Introduction a la Metallographie Microscopique (Introduction to Microscopic Metallography). 227 pages; 157 figures and 34 plates with 97 microphotographs. Published by A. Herman et Fils, Paris. Price, paper bound, 10 francs.

The book is a translation into the French by A. Corvisy of Professor Goerens's "Einfuhrung in die Metallographie," the translation having been reviewed and augmented by F. Robin. It is divided into five parts: "Physical Properties of Matter," "The Practice of the Micrography of Metals," "Physical Mixtures," "Alloys," and "Metallography of the Iron Carbon Alloys." Most of the new matter has been added to the part on alloys, being details of the cooling curve diagrams, of binary and ternary alloys which have been studied since the original was written. With these exceptions the text of Goerens' well-known work has been carefully followed. The result is an excellent textbook for all students of metallography, especially valuable to those interested in alloys, or those who can read French more readily than German. An excellent English translation of Professor Goerens's book is published by Longmans, Green & Co., London and New York.

Fowler's Mechanics' and Machinists' Pocket Book and Diary for 1911.—Size 3¾ x 6 in.; pages 456. Bound in cloth. Price sixpence net. Published by the Scientific Publishing Company, Manchester, England.

This little hand book which is revised annually is a synopsis of practical rules for fitters, turners, millwrights, erectors, patternmakers, foundrymen, draftsmen, apprentices, students, &c. It is divided into 16 sections, each of which deals with some one line of interest to the various kinds of mechanics. Each of these sections has its own separate title page, and blank pages are bound at the end for memoranda. The first 37 pages are given over to handy references and tables followed by a section on measuration, geometry and trigonometry. Twenty-two pages are devoted to the use of logarithms and mechanical calculating devices. Following this in order are sections on materials used in machine construction, machine tool design and the proportion of machine tool parts, metal cutting tools, high speed tool steels, drilling and boring metal, screw cutting and taper turning and emery wheels. Another section of importance is that on shop practice which occupies 40 pages and contains a number of useful hints. The transmission of power by gears, belt and rope drives and shafting is discussed, and a section on wire rope and chains for hoisting completes the book.

The Life of Electrical Apparatus.—The Allis-Chalmers Company, Milwaukee, Wis., is distributing photographs showing two Bullock electric motors taken from the ruins of the Los Angeles *Times* Building. After the explosion and fire which recently destroyed this building, these motors were removed from the basement where they were lying in 5 ft. of water. The presses to which they were attached were completely destroyed and had no value except as scrap iron. The motors, however, were not badly damaged, although electrical apparatus is generally considered to be less rugged than some other classes of machinery. They were practically the only article of value saved from the ruins. The larger motor is 60 hp. and the smaller is 10 hp. They are now being rewound in the shops of the manufacturer, the Allis-Chalmers Company, and will be used to drive presses in the new building which is soon to be erected.

British Pig Iron Output, First Half of 1910.—The output of pig iron in Great Britain in the first half of 1910, as just published by the British Iron Trade Association, was 4,993,745 gross tons, an increase of 45,137 tons over that for the second half of 1909. The output of forge and foundry irons declined 185,000 tons, while that of basic iron increased 239,000 tons. The figures for Bessemer iron and for spiegeleisen and ferromanganese were about the same.

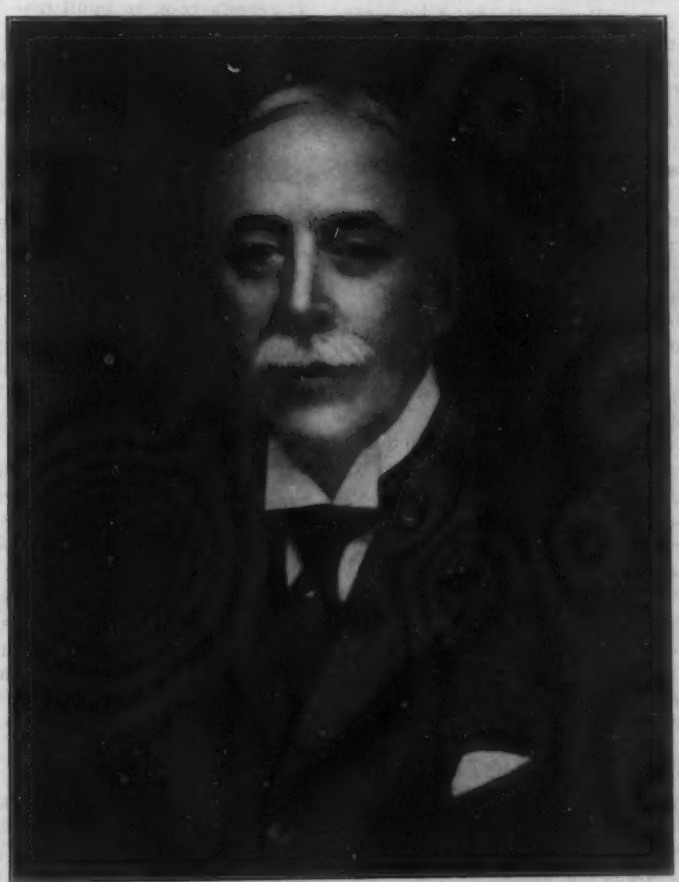
Steel Corporation President

James A. Farrell Unanimously Chosen

Chairman E. H. Gary of the United States Steel Corporation made the following announcement Tuesday afternoon, January 10:

"The Finance Committee of the United States Steel Corporation, after consulting individual members of the Board of Directors not on the committee, has unanimously decided to recommend to the board at its next regular meeting the election of James A. Farrell as president of the corporation. Mr. Farrel has been the president of the United States Steel Products Company ever since its organization in 1903, and as such has demonstrated great business capacity. He has been connected with the manufacturing and commercial departments of the iron and steel industry for more than 25 years, and is well qualified to fill the position. It is believed the selection will be gratifying to all of the officials of subsidiary companies and to every one connected with the industry."

Mr. Farrell's administration of the affairs of the United States Steel Products Company has produced one of the most noteworthy developments in the history of the Steel Corporation. The building up of a world-wide trade in American steel products involved problems for the working out of which precedents were not abundant, and the results represent to a high degree initiative and a talent for organization. To-day the Steel Products Company is directly represented at 55 foreign trade centers and its ramifications in the steel trade of the world are far more extensive than is commonly appreciated. In the movement for the maintenance of friendliness and co-operation among the steel manufacturers of competing countries Mr. Farrell has had an important part as was indicated by the public expressions of the foreign guests of the American Iron and Steel Institute at the New York meeting of last October. He is chairman of the Institute's Committee on Foreign Relations, and at the October meeting presented a paper under the title, "Foreign Relations," which dealt with the problems growing out of the competition of the principal producing countries for the world's trade in iron and steel. As indicating the attitude of the new president on the international questions which have assumed such importance in the industry in recent years, we quote from his New York paper as follows:



JAMES A. FARRELL.

The problem of how to dispose of our products without demoralizing the markets of our competitors will, I believe, practically be solved by a policy of conciliation and consideration. It has often been said that steel is either a prince or a pauper. Under conditions of extreme competition the latter is inevitable, but experience has proved that with co-operation as the guiding policy steel need never be a pauper, nor yet occasionally a prince, and normal conditions may be maintained to the benefit of manufacturer, merchant, consumer and laborer. . . .

A general adoption of the principle of co-operation in place of ruinous competition, resulting in more stable conditions in the steel industry, would naturally enable manufacturers to carry out plans for the betterment of labor, which the changeable conditions of the steel industry have heretofore impeded, such as pensions, insurance against accidents and amelioration of working conditions. It would lead to refinement of practice, improvement of plants and the installation of safety appliances. It would ultimately permit of reduction in costs, and it has been the history of every industry, including the steel industry, that reductions in cost of manufacture are invariably reflected in the prices to the consumer. Thus the consumer must eventually benefit, and without reducing the fair and normal profit to the manufacturer.

Mr. Farrell's early experience was in wire manufacture, and he has the rare combination of thorough acquaintance with both the operating and commercial sides of the steel industry. His first work as a boy of 16 was in a wire mill at New Haven, Conn. After nine years at New Haven he went to Pittsburgh, becoming assistant superintendent, and later superintendent of the Oliver Wire Company. He took part in the organization of the Pittsburgh Wire Company in the early eighteen nineties, building the plant of this company at Braddock, which is now operated by the American Steel & Wire Company. Mr. Farrell was secretary and general manager of the company, and started its new plant early in 1892. On the organization of the original American Steel & Wire Company, which took over the Pittsburgh plant with others, Mr. Farrell was made general sales manager of the export trade, with headquarters in New York. On the formation of the United States Steel Products Export Company (now the United States Steel Products Company) in 1903, Mr. Farrell was made president. He has frequently gone abroad in the interest of that company, and is the best known of American steel manufacturers among the heads of the industry in Europe. He is in his forty-ninth year.

A recent performance in metal cutting with oxygen is reported by the British engineering papers. It is stated that one man employed by the Knowles Oxygen Company, Ltd., cut through 42 girders, 15 x 5 in. section, weighing about 40 tons, in 4¾ hours, with a consumption of less than 200 ft. of oxygen and 300 ft. of hydrogen. Reckoning labor at 1 shilling per hour the cost figured out 6 pence per cut.

The Thomas Iron Company, Hokendauqua, Pa., and the Empire Steel & Iron Company, Catasauqua, Pa., have reduced wages 10 per cent. Both companies operate blast furnaces in several localities.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 11, 1911.	Jan. 4, 1911.	Dec. 14, 1910.	Jan. 12, 1910.
PIG IRON, Per Gross ton:				
Foundry No. 2, standard, Philadelphia	$15.50	$15.50	$15.50	$19.00
Foundry No. 2, Southern, Cincinnati	14.25	14.25	14.25	17.25
Foundry No. 2, local, Chicago	15.50	15.50	16.00	19.00
Basic, delivered, eastern Pa.	14.75	14.75	14.75	18.75
Basic, Valley furnace	13.25	13.25	13.50	17.00
Bessemer, Pittsburgh	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh	**14.15**	13.90	13.90	17.40
Lake Superior charcoal, Chicago	18.00	18.00	18.00	19.50
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh	28.00	28.00	....	31.00
Open hearth billets, Philadelphia	25.40	25.40	25.50	30.60
Wire rods, Pittsburgh	28.00	28.00	28.00	33.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	*14.50*	15.50	15.50	20.00
Iron rails, Philadelphia	17.00	17.00	17.00	20.50
Car wheels, Chicago	13.00	13.00	13.50	18.50
Car wheels, Philadelphia	13.00	13.00	13.25	17.50
Heavy steel scrap, Pittsburgh	13.50	13.50	13.75	17.75
Heavy steel scrap, Chicago	11.50	11.50	12.00	16.00
Heavy steel scrap, Philadelphia	12.50	12.50	12.50	17.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.32½	1.32½	1.35	1.65
Common iron bars, Chicago	1.30	1.30	1.35	1.60
Common iron bars, Pittsburgh	1.35	1.35	1.40	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh	1.40	1.40	1.40	1.55
Beams, tidewater, New York	1.56	1.56	1.56	1.71
Beams, Pittsburgh	1.40	1.40	1.40	1.55
Angles, tidewater, New York	1.56	1.56	1.56	1.71
Angles, Pittsburgh	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.30	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*	1.70	1.70	1.70	1.85
Cut nails, Pittsburgh	1.60	1.60	1.60	1.85
Barb wire, galv., Pittsburgh*	2.00	2.00	2.00	2.15
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.75*	13.00	13.00	14.12½
Electrolytic copper, New York	*12.50*	12.75	12.75	13.87½
Spelter, New York	5.55	5.55	5.85	6.25
Spelter, St. Louis	5.40	5.40	5.75	6.12½
Lead, New York	4.50	4.50	4.50	4.70
Lead, St. Louis	4.35	4.35	4.35	4.65
Tin, New York	**40.25**	39.55	38.55	32.85
Antimony, Hallett, New York	**8.00**	7.55	7.75	8.25
Tin plate, 100-lb. box, New York	$3.84	$3.84	$3.84	$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c., net; zees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c. base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates), 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c.. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; No. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, $1.55 per square. Galvanized sheets, No. 28, $2.75 per square for 2½-in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt Weld.				
⅛, ¼, ⅜ in	72	58	68	54
½ in	75	63	71	59
¾ to 1½ in	79	69	75	65
2 to 3 in	80	70	76	66
Lap Weld.				
2 in	76	66	72	62
2½ to 4 in	78	68	74	64
4½ to 6 in	77	67	73	63
7 to 12 in	75	59	71	55
13 to 15 in	51½	..	..	..
Butt Weld, extra strong, plain ends, card weights.				
¼, ⅜, ⅜ in	69	59	65	55
½ in	74	68	70	64
¾ to 1½ in	78	72	74	68
2 to 3 in	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in	75	69	71	65
2½ to 4 in	77	71	73	67
4½ to 6 in	76	70	72	66
7 to 8 in	69	59	65	55
9 to 12 in	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in	64	58	60	54
¾ to 1¼ in	67	61	63	57
2 to 3 in	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in	65	59	61	55
2½ to 4 in	67	61	63	57
4½ to 6 in	66	60	62	56
7 to 8 in	59	49	55	45

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Plugged and Reamed.

1 to 1½, 2 to 3 in.	Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified.
2, 2½ to 4 in.	Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.	49	43
1⅜ to 2¼ in.	61	43
2½ in.	63	48
2¾ to 5 in.	69	55

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, $28; open hearth and chain rods, $28.

Steel Rivets.—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ⅝ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Pittsburgh

PARK BUILDING, January 11, 1911.—(*By Telegraph.*)

Pig Iron.—A sale of 1000 tons of gray forge is reported, this being the first transaction in that grade for some time. The price named is $13.50, Valley furnace, and it is for first half delivery. More inquiries are in the market. Some demand is developing for basic. Bessemer pig iron is quiet. Small transactions have occurred in foundry iron. We quote Bessemer iron nominally at $15; basic, $13.25; No. 2 foundry, $13.75 to $14, and gray forge, $13.25 to $13.50, all at Valley furnace, with a freight rate of 90 cents a ton to Pittsburgh.

Steel.—Buyers are waiting for the result of the steel makers' meeting in New York to-day. We quote Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at $23, base, and sheet and tin bars in 30-ft. lengths, $24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at $24 and forging billets at $28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(*By Mail.*)

A great deal of business is undoubtedly being held up to await the action of steel manufacturers at the meeting in New York to-morrow (Wednesday), and it is believed, even if prices are not reduced, that at least a portion of it will then be placed. Some of it is for work that has to be done and therefore cannot be held up much longer. The merchant blast furnace operators in the valleys are still trying to work out a plan to put their interests on a better basis, but it is doubtful if anything will come of it. Operations among blast furnaces and steel works are now on a basis of not over 50 per cent. of capacity, and yet customers have no trouble whatever in getting prompt deliveries on the few new orders they are placing.

Ferromanganese.—A sale is reported of 75 to 100 tons of foreign 80 per cent. on the basis of about $38, Baltimore. While the demand is dull, prices are fairly strong. Foreign 80 per cent. is quoted at $38, Baltimore, for the first half, carrying a freight rate of $1.95 a ton for delivery in Pittsburgh district.

Ferrosilicon.—No sales have been reported in this market for several weeks. Prices are only fairly strong and could probably be shaded on 50 per cent. on a firm offer. We quote 50 per cent. for delivery over first half at $54 to $55, and for prompt delivery at $55 to $55.50. We quote 10 per cent. blast furnace silicon at $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Jisco and Ashland furnaces.

Skelp.—The mills have only a small amount of work on their books. The leading local buyer of iron and steel skelp is pretty well covered for first quarter and new inquiry is light. Prices are lower than they have been for several years. We quote grooved steel skelp, 1.25c. to 1.30c.; sheared steel skelp, 1.30c. to 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers' mills in the Pittsburgh district, usual terms.

Muck Bar.—The little new inquiry is only for small lots for prompt shipment. We quote best grades at nominally $29, Pittsburgh. The A. M. Byers Company has completed the building of 42 new puddling furnaces at its plant at Girard, Ohio, but these have not as yet been started up. The output will be used by the company in the manufacture of iron pipe, its mills being located in this city.

Steel Rails.—The Cambria Steel Company has booked an order for 500 tons of standard sections for prompt delivery. Little is doing in light rails, new orders and specifications against contracts last week having been smaller than for some time. The Carnegie Steel Company has taken several fairly large orders for steel ties which are rolled at the Duquesne Works. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per pound.

Plates.—The steel car interests are figuring on more car inquiries than for some time. So far but few have developed into actual orders, the railroads apparently waiting for the outcome of the steel makers' meeting before definitely placing contracts. The general plate trade is dull and none of the mills is operating at present to more than 50 per cent. of capacity. We quote plates, ¼-in. and heavier, in narrow and wide sizes, at 1.40c., Pittsburgh.

Structural Material.—A fair number of inquiries are in the market. It is stated that bridge work for a Western road, involving upward of 15,000 tons, has been placed with a local interest, but details are not yet ready to be given out. The Cambria Steel Company has taken two contracts for bridge work, involving about 400 to 500 tons. We continue to quote beams and channels up to 15 in. at 1.40c., Pittsburgh.

Sheets.—Another meeting of sheet manufacturers was held in this city January 7, at which J. A. Campbell of the Youngstown Sheet & Tube Company presided. Reports made at the meeting indicate that while new business in sheets is light, prices are being well maintained. No reduction was made. As a rule the sheet mills are working to 50 per cent. or less and have been for some time. The full schedule of prices on black, galvanized and roofing sheets is printed on a previous page.

Tin Plate.—Specifications against contracts are coming in at a fairly satisfactory rate, but new orders are light. Regular prices are being maintained, as a result of the meeting held here several weeks ago. We quote $3.60 per base box, f.o.b. Pittsburgh, for 100-lb. cokes.

Bars.—Railroads are placing some fair sized orders for iron bars. Specifications against contracts for steel bars are only fairly satisfactory. We quote soft steel bars at 1.40c., and common iron bars at 1.35c., f.o.b. Pittsburgh.

Hoops and Bands.—Some good sized contracts for hoops and bands have lately been placed by the cooperage trade, on which specifications are now being received, but there are intimations that the regular price of 1.50c. has not in all cases been observed in making these contracts. We quote hoops at 1.50c.; bands, 1.40c. in carload and larger lots and 1.45c. in small lots, the latter carrying extras as given in the steel bar card dated September 1, 1909.

Spikes.—Some time ago inquiries came in the market from some of the leading Western roads for quite a heavy tonnage in spikes, but so far the business has not been placed. New orders are still for small lots to cover actual needs. All the spike makers are badly in need of more business. We quote standard sizes of railroad spikes at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade. We quote small railroad and boat spikes at 1.60c. to 1.65c. base, in carload and larger lots.

Spelter.—Prices have firmed up somewhat in the past week and we now quote best grades of Western at 5.40c. to 5.42½c. East St. Louis, equal to 5.52½c. and 5.55c., Pittsburgh. The demand is reported as slightly better.

Merchant Steel.—So far this month new orders and specifications against contracts show a slight gain as compared with December. We quote, f.o.b. Pittsburgh: Iron finished tire, 1½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Shafting.—Some improvement is noted in new orders

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and in specifications against contracts, mostly from the automobile builders, who are taking in a little more material now than for some time. Regular discounts on cold rolled steel shafting are 57 per cent. off in carload and larger lots and 52 per cent. off in small lots, delivered in base territory.

Rivets.—The demand is still confined to small lots to cover actual needs, and specifications against orders placed some time ago are not very satisfactory. Regular prices of 1.90c. on structural rivets and 2c. on boiler rivets are fairly well maintained.

Wire Products.—The new demand for both wire nails and wire is still confined to small lots to cover actual needs, but it is believed that before this month is out jobbers and retailers will be buying more heavily in view of the expected opening of spring trade at an early date. We quote galvanized barb wire at $2; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination being added.

Merchant Pipe.—This being the dull season in the pipe trade, new orders are confined to small lots to cover actual needs of consumers or such as may be desired by jobbers to maintain their stock. Orders are often accompanied with the request for prompt shipment, showing that jobbers' stocks are very low; in fact, stocks of both mills and jobbers are reported to be lower than in a long time. Spang, Chalfant & Co. have taken an order for 13 miles of 16-in. pipe for one of the leading gas interests. It is stated that discounts on both iron and steel pipe are being fairly well maintained.

Boiler Tubes.—In the early part of last month several leading railroads came in the market with inquiries for quite a large tonnage of boiler tubes, but this business has not yet been placed. It is believed there will be a better movement shortly, as the boiler tubes for quite a large number of the locomotives recently ordered have not yet been bought. The demand for merchant tubes is very dull and discounts are more or less shaded.

Iron and Steel Scrap.—The market is almost stagnant as regards sales by dealers to consumers, but prices are fairly strong. The scrap lists of the Pennsylvania and the Southern railroads close to-morrow (Wednesday). The Pennsylvania list contained over 4000 tons of old rails, on which bidding by the dealers is reported to have been quite brisk. We note a sale of 300 tons of heavy steel scrap at $13.50, delivered, and also sales of upward of 2000 tons of cast iron borings at $8.75, delivered, equal to $8.10, Pittsburgh. Dealers quote about as follows, per gross ton, f.o.b. Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.50 to $13.75
No. 1 foundry cast	13.50 to 13.75
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, at point of shipment	9.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.	14.75 to 15.00
No. 1 railroad malleable stock	13.00 to 13.25
Grate bars	11.25 to 11.50
Low phosphorus melting stock	17.25 to 17.50
Iron car axles	24.00 to 24.50
Steel car axles	20.25 to 20.50
Locomotive axles	24.00 to 24.50
No. 1 busheling scrap	12.25 to 12.50
No. 2 busheling scrap	8.75 to 9.00
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.75 to 16.00
Cast iron borings	8.00 to 8.10
Machine shop turnings	8.60 to 8.75
Old iron rails	16.00 to 16.25
No. 1 wrought scrap	14.50 to 14.75
Stove plate	14.50 to 14.75
Heavy steel axle turnings	10.25 to 10.50

Coke.—New inquiries for either furnace or foundry coke are very scarce. The coke trade generally is in a very unsatisfactory condition. Efforts to form a co-operative selling arrangement to handle the output of a number of the independent coke interests are not meeting with much success. We quote standard makes of furnace coke for spot shipment at $1.40 to $1.50 per net ton, at oven, while for delivery over first half of 1911 from $1.75 to $2 is quoted. Best makes of 72-hour foundry coke for spot shipment are held at $1.90 to $2 per net ton, at oven, and for first half of the year at $2.25 to $2.50.

Chicago

FISHER BUILDING, January 11, 1911.—(*By Telegraph.*)

There has been a turn for the better in the market for finished materials this week. As a result the Gary rail mill will start up next week, orders having been taken within a few days for 20,000 tons of open hearth rails, one Western road wanting 4000 tons for immediate shipment. Orders for track supplies have been held back for a long time by the general embargo on railroad purchases, but since the first of the year local mills have booked several thousand tons. The leading interest has practically withdrawn from the forging billet market in this territory by maintaining the quotation of $31, which was reported last week, other mills taking at lower figures what little business is going. During the first half of last year that interest did not quote on billets in this territory, because the crude steel was needed in its own finishing departments, but during the last half low prices were made. The practical withdrawal at this time is taken as an indication that the capacity of the mills in this district will soon be required by the finishing departments. The closing of several good structural contracts in Chicago has been delayed awaiting the outcome of the conference of steel manufacturers in New York. It is expected that contracts amounting to about 20,000 tons will be let in Chicago before the end of the week. The actual improvement in the trade has been confined thus far to railroad purchases and has not extended to bars, sheets and other finished material. Prices are holding firmly, but buyers are apparently not satisfied and are purchasing only for immediate needs. Orders from store are more satisfactory, running into carload lots in bars, plates, structural shapes and galvanized sheets, with a good volume of small orders. There are good inquiries for fabricated material from store. The scrap market is steadier after the slump during the holidays.

Pig Iron.—There are more good inquiries for Southern iron this week than there have been for two months. A local stove manufacturer has purchased 1000 tons of Southern, half No. 2 and half No. 3, and is in the market for 400 tons of high silicon Southern and 1000 tons of Northern foundry. Several other sales have been closed of 1000 and 2000-ton lots of Southern. One lot of 1200 tons of high phosphorus Southern was sold last week to the leading harvester interest for delivery in Canada at an inside price. Prices have been weak for some time on high phosphorus iron from Tennessee furnaces. One brand running about 2 per cent. phosphorus has been offered at $10.50, Birmingham, and one or two other brands running a little lower in phosphorus have been selling at $10.75 for a No. 2 grade. Concessions have also been made on Alabama iron running a little below No. 2 in silicon analysis. There have not been enough sales below $11 to justify a reduction in the market quotation, but $11, Birmingham, for first half is now openly recognized on the standard brands. If inquiries continue at the rate they have been coming for two or three days there will be a fair buying movement under way, which will strengthen the market. There are several inquiries for Northern foundry, but buyers have not shown a disposition to close for round lots. A St. Louis interest is in the market for 5000 tons of basic, and there is also an inquiry pending for a round lot of low phosphorus steel-making iron. Railroads have been quiet purchasers of a considerable amount of charcoal and foundry iron. The following quotations are for January, February and March shipment, Chicago delivery:

Lake Superior charcoal	$18.00 to $18.50
Northern coke foundry, No. 1	16.00 to 16.50
Northern coke foundry, No. 2	15.50 to 16.00
Northern coke foundry, No. 3	15.25 to 15.75
Northern Scotch, No. 1	16.50 to 17.00
Southern coke, No. 1	15.85 to 16.35
Southern coke, No. 2	15.35 to 15.85
Southern coke, No. 3	15.10 to 15.60
Southern coke, No. 4	14.85 to 15.35
Southern coke, No. 1 soft	15.85 to 16.35
Southern coke, No. 2 soft	15.35 to 15.85
Southern gray forge	14.60 to 15.10
Southern mottled	14.60 to 15.10
Malleable Bessemer	15.50 to 16.00
Standard Bessemer	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%	18.40 to 18.90
Jackson Co. and Kentucky silvery, 8%	19.40 to 19.90
Jackson Co. and Kentucky silvery, 10%	20.40 to 20.90

(*By Mail.*)

Billets.—The leading interest maintains the quotation of $31, Chicago, as the base price for forging billets and other mills selling here will revise their quotations on a corresponding basis, although the price is regarded as somewhat high under present market conditions.

Rails and Track Supplies.—The Gary rail mill will resume rolling next week and the prospects for rail orders are greatly improved. A Western road has ordered 4000 tons of open hearth rails for immediate shipment. A tentative order has been booked from an Eastern line for 16,000 tons of open hearth standard rails, the formal contract not having been signed as yet. Good orders have been taken the past week for bolts and track supplies. One of the orders booked was for 2500 tons of continuous joints. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.20c. to 2.30c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb., 1.25c. to 1.29½c., Chicago.

Structural Material.—The Waldheim building at Kan-

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sas City, Mo., 1200 tons, was let last week to the Kansas City Structural Steel Company. The Union National Bank building at Houston, Tex., 1500 tons, was let to the Noelke-Richards Company, Indianapolis. Three buildings in Chicago are in the hands of general contractors and are expected to be let this week. The steel for the Insurance Exchange building will amount to 13,000 tons, the general contract being held by the Thompson Starrett Company. The George A. Fuller Company has the general contract for the McNeil building, 1200 tons, and additions to the McCormick building, 1400 tons, which it is understood will be let immediately after the conference of steel manufacturers in New York. Bids are being asked this week on the Monroe building, about 3000 tons, at Michigan avenue and Monroe street. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—A fair lot of specifications has been received for car work. Other bookings for the plate mills are small, consisting of miscellaneous lots of boiler and tank plates and material going into structural work. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—The Inland Steel Company's sheet mill is running about 50 per cent., chiefly on specifications on old contracts. Prices continue firm and the leading mills in the sheet trade seem to be satisfied for the time to take their share of the business that is going. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

Bars.—Both new business and specifications for soft steel bars are below the normal volume. The agricultural implement manufacturers are somewhat slow in specifying on account of doubts regarding the maintenance of prices. This is the dull season of the year for hard steel bars. The bar iron mills continue to gain in production as the railroads are improving steadily in their specifications. Orders for 500 to 1000-ton lots, accompanied by specifications for prompt shipment, are becoming quite frequent. The mills are unwilling to make forward contracts on the present market, but very low inside prices are reported on large orders for prompt shipment. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.30c. to 1.35c.; hard steel bars rolled from old rails, 1.40c. to 1.45c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Wire Products.—The wire mills are running about two-thirds of capacity, making a much better showing than anything else in the line of finished materials. The wire manufacturers expect more active buying from now on, as the trade season is somewhat late. The manufacturers of wire cloth, poultry netting and screen doors did not announce their prices until December 1, about a month later than usual, thus shortening the season in their lines, and jobbers and hardware dealers have been slow in specifying for spring shipments. Prospects in the distributing trade are very favorable and consumption is expected to be normal at least. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—This is one line of finished material in which the mills have practically normal specifications on their books, the falling off in some special products being offset by the increase in the demand for agricultural steel.

Cast Iron Pipe.—The city of Chicago opened bids Monday for about 10,000 tons of water pipe, on which the United States Cast Iron Pipe & Foundry Company was the low bidder. The price of 12 to 48 in. sizes was about $24, Chicago, delivered by teams. The same interest has booked a contract from a leading railroad for 1500 tons of culvert pipe to be specified during the year. Practically all of the leading gas companies in the West are negotiating for their requirements in gas pipe for the coming season, the total tonnage reaching a large aggregate. Portland, Ore., will consider bids to-night on 6000 tons of water pipe. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., $25; 6 to 12-in., $24; 16-in. and up, $23.50, with $1 extra for gas pipe.

Old Material.—Old iron rails have taken a drop, as there is no sale for them at present in this market. Rerolling steel rails are weak. Heavy melting steel is a little firmer, as the drop last week was due to freight congestion at the leading buyer's mill. The improvement in the demand from the railroads for bar iron has encouraged the rolling mills to increase their stocks of scrap, but has not made any change in prices. Cast scrap is weak. There is no real demand from any source, as the market is overstocked with material in transit and buyers are taking advantage of the situation by forcing fractional concessions when they relieve the dealer of cars that arrive. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to $1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered, Chicago:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft	13.00 to 13.50
Relaying rails, standard sections, subject to inspection	23.00 to 24.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.50 to 12.00
Shoveling steel	11.00 to 11.50

The following quotations are per net ton:

Iron angles and splice bars	$13.00 to $13.50
Iron arch bars and transoms	14.00 to 14.50
Steel angle bars	11.00 to 11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.75 to 18.25
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Steel knuckles and couplers	11.25 to 11.75
Locomotive tires, smooth	17.00 to 17.50
Steel axle turnings	7.75 to 8.25
Machine shop turnings	6.50 to 7.00
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	9.25 to 9.75
No. 2 busheling	7.25 to 7.75
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
Boiler punchings	13.00 to 13.50
No. 1 cast scrap	12.00 to 12.50
Stove plate and light cast scrap	10.25 to 10.75
Railroad malleable	11.00 to 11.50
Agricultural malleable	10.50 to 11.00
Pipes and flues	8.75 to 9.25

Philadelphia

PHILADELPHIA, PA., January 10, 1911.

In some classes of finished materials business has been a shade better, due probably to specifications coming out which had been held up previous to the year end. Pig iron continues dull, with inquiries light and small in size. Definite orders received by the Baldwin Locomotive Works for 218 locomotives have had a buoyant effect on makers of materials entering into their construction, while inquiries for several thousand freight cars from the Pennsylvania Railroad have contributed to a better sentimental feeling in the plate and shape trade. A little better inquiry for steel billets is noted, but no business of importance has been placed.

Iron Ore.—Buying is at a standstill. Importations at this port the past week were confined to one cargo, 3600 tons, valued at $9900.

Pig Iron.—The most important business the past week was the purchase by the Pennsylvania Railroad of 1600 tons of charcoal iron, and it has been decided to take the maximum tonnage of coke foundry iron inquired for, 1800 tons, the contract for which will probably be placed in a few days. Other transactions in foundry grades have been closely confined to small lots. Prices show practically no change, but there has not been enough demand recently to test the market. Off grade foundry irons, such as the ordinary Lebanon Valley makes, are, however, obtainable at less than the prices named for standard brands. Small sales of Virginia foundry iron have been made for shipments ranging from first quarter to first half of the year. Cast iron pipe makers are still looking around for pretty fair blocks of low grade iron, but their ideas of prices are still too low to interest producers. Buyers of foundry iron generally are proceeding cautiously, usually taking only sufficient quantities for near future requirements, as, from present indications, there is little chance of higher prices in the near future. A few inquiries for small lots of forge iron are out, but there is little indication of active buying. The steel making grades of pig iron are practically at a standstill. A few small sales of low phosphorus iron are reported. General quotations are unchanged, the following range of prices being named for deliveries running through the first quarter and half in buyers' yards in this vicinity:

Eastern Pennsylvania, No. 2 X foundry	$15.50 to $15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.25 to 14.50
Basic	14.75
Standard low phosphorus	22.00 to 22.50

Ferroalloys.—A few small sales of ferromanganese to consumers in this district are reported at $38.25 to $38.50, Baltimore, but the demand is not active. Moderate sales of 50 per cent. ferrosilicon are also reported, at prices ranging from $55 to $56, seaboard, according to quantity and delivery.

Billets.—More inquiry for both forging and rolling

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billets is noted, largely, however, makers contend, with a view of testing the market, as but little business has been placed. Leading Eastern producers are now quoting the Pittsburgh base for both rolling and forging billets, that for standard open hearth rolling billets being $25.40, and ordinary forging billets $30.40, delivered in this vicinity.

Plates.—Reports show varied conditions, mills in some instances having had a better run of orders, due probably to the releasing of business held up at the year end. A better feeling, however, is noted, with increasing business in sight from locomotive, car, tank, bridge and boiler work. Eastern makers are maintaining recent prices, 1.55c. minimum being quoted for ordinary plates, delivered in this territory.

Structural Material.—The contract for the structural work for the Packard Motor Car Company's new building in this city, requiring about 800 tons, one-half of which is Bethlehem shapes, has been let, but the bulk of the orders coming out are for small miscellaneous requirements. Prices are being maintained at 1.55c. minimum for ordinary shapes, delivered in buyers' yards in this territory.

Sheets.—Consumers continue to place orders in small lots and for prompt delivery, as a result of which mills have but little business ahead, but keep fairly active on day to day specifications. Prices are being firmly held, Eastern mills quoting the following range for early deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—While the leading producers of steel bars are maintaining the recent quotation of 1.55c., delivered in this territory, some makers of refined iron bars are still accepting orders at 1.25c., Eastern mill, equal to 1.32½c., delivered here, although others hold for a full tenth advance. The demand has not been active, the bulk of the business closed being confined to small and moderate lots for early delivery.

Coke.—The demand is irregular. Contracts for furnace coke for delivery over various portions of the year are still pending, while some little spot business has been done. A few fair inquiries for foundry coke are before the trade. Prices show little change, standard brands being firm, but quotations for less well-known makes are irregular. The following range about represents quotations per net ton, for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.20 to 4.40
Mountain furnace coke	3.35 to 3.50
Foundry coke	3.85 to 4.05

Old Material.—Dullness characterizes the market. What little business is done has been confined to small lots for early shipment, not enough being offered in any grade to really test prices. Small sales of heavy melting steel at prices around $12.50 to $12.75 are reported, but mills do not buy more than small lots unless at bargain prices. Railroad lists this month are reported to be the lightest for a long period. A waiting market prevails, with quotations largely nominal. The following range, however, about represents sellers' ideas of the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to $1.35 per gross ton:

No. 1 steel scrap and crops	$12.50 to $13.00
Old steel rails, rerolling	15.50 to 16.00
Low phosphorus	18.00 to 18.50
Old steel axles	19.50 to 20.00*
Old iron axles	26.00 to 27.00*
Old iron rails	17.00 to 17.50*
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	15.75 to 16.25
Wrought iron pipe	12.25 to 12.75
No. 1 forge fire	11.00 to 11.50
No. 2 light iron	7.00 to 7.50
Wrought turnings	8.00 to 8.50
Cast borings	8.00 to 8.50
Machinery cast	14.00 to 14.50
Railroad malleable	13.00 to 13.50
Grate bars	11.00 to 11.50
Stove plate	10.00 to 10.50

* Nominal.

The Alan Wood Iron & Steel Company on January 3 blew in its No. 2 Heckscher Furnace at Swedeland, which has been undergoing repairs. It will produce low phosphorus iron.

Cleveland

CLEVELAND, OHIO, January 10, 1911.

Iron Ore.—The desire expressed by some of the furnace interests that ore prices be fixed for the coming season at once is not meeting with much favor among merchant ore shippers. The latter contend that should action be taken now reaffirming last season's prices, as wished by some of the consumers, such action would not be regarded as conclusive, and many would look for a cut later, and should a price reduction be made nobody would buy ore now anyway. Giving the above as their reasons, the ore firms seem determined to defer any action on prices until consumers are ready to buy. When that time comes they say they will be guided by the conditions as they then exist, and for the present they are unwilling to express views regarding the matter that may be taken either as indicative of price reduction or price maintenance. We quote prices as follows: Old Range Bessemer, $5; Mesaba Bessemer, $4.75; Old Range non-Bessemer, $4.20; Mesaba non-Bessemer, $4.

Pig Iron.—The only sales reported are a few small lots. The only new inquiry of any size is from a Massillon cast iron pipe company for 1000 tons of No. 3 foundry iron and 1000 tons of No. 4. An inquiry for 1000 tons a month of No. 3 foundry for delivery through the entire year that came from the Coshocton plant of a cast iron pipe company late in December is still pending, efforts to secure prices lower than have recently been quoted having so far apparently proved unsuccessful. Many foundries have good sized stocks on their yards and have not yet renewed shipping orders that were suspended late last month. No change is noted in prices. No. 2 foundry is firm at $14, furnace, for local delivery, and about $13.75 for outside shipment. The stack of the Upson Furnace Company in Cleveland, which went out during the fall for repairs, was blown in on foundry iron January 7. As soon as the company's new steel plant is ready for operation this stack will go on basic iron. For prompt shipment and the first half we quote, delivered, Cleveland, as follows:

Bessemer	$15.90
Northern foundry, No. 1	14.50
Northern foundry, No. 2	14.25
Northern foundry, No. 3	14.00
Gray forge	13.90
Southern foundry, No. 2	15.35
Jackson Co. silvery, 8 per cent. silicon	19.00

Coke.—The market is very dull, no inquiries for lots of any size of either grade having developed since the first of the year. Prices remain stationary. We quote standard furnace coke at $1.45 to $1.50 per net ton, at oven, for spot shipment, and $1.75 to $1.85 for the first half. Connellsville 72-hour foundry coke is held at $2 to $2.15 for spot shipment and $2.25 to $2.50 for the first half.

Finished Iron and Steel.—Orders generally are only for small lots for immediate requirements. Stocks of both jobbers and consumers are low. The only exception to the generally light demand is the agricultural implement trade. Implement makers in this territory did a record breaking business in 1910, and the volume of advance orders makes the outlook very promising for the present year. Liberal specifications for steel bars are coming from this trade. Buyers generally are holding off until after the New York conference of steel makers this week to see if any changes in prices are made. Steel bars and structural material are firm, at 1.40c., Pittsburgh, and the 1.40c. price on plates is now being maintained by local mills. The demand for sheets continues light, but there are no reports of shading. Forging billets are now firm, at $28, Pittsburgh, there being some demand for carload lots. The structural situation is quiet, the new work that has come out requiring only small lots. Rivet prices remain stationary, concessions of $2 a ton from regular prices fairly representing the present market. The demand for iron bars is not active; prices are steady, at 1.30c. to 1.35c., at mill.

Old Material.—The embargo placed on scrap December 1 by the Otis Steel Company was lifted Monday, and other consumers are taking some shipments on contracts. Owing to the absence of transactions during the past two or three weeks, dealers' quotations are largely nominal. Dealers with scrap on the track that they were anxious to dispose of during the past week were compelled to accept about 50 cents a ton less than recent quotations in order to move it. The Norfolk & Western Railroad will close January 18 on a usual sized list. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	$13.75 to $14.25
Old iron rails	15.50 to 16.00
Steel car axles	19.50 to 20.00
Heavy melting steel	12.50 to 12.75
Old car wheels	12.00 to 12.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	11.75 to 12.00
Railroad malleable	13.00 to 13.50
Light bundled sheet scrap	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	8.75 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	12.50 to 13 00
No. 1 cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Bundled tin scrap	11.00 to 11.50

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Cincinnati

CINCINNATI, OHIO, January 11, 1911.—(*By Telegraph.*)

Pig Iron.—A larger number of inquiries are coming in, and although they are principally for small amounts, there is a much better feeling. The inquiries range from carloads to 300-ton lots, with a sprinkling of requests for prices on larger tonnages. An Indiana company wants 1200 tons of either Northern or Southern No. 2 foundry, and there are several inquiries out for 500-ton lots of foundry iron from the Central Western territory. The Ohio stove maker wanting 1500 tons for first half delivery has not yet closed, but action is expected soon. Some early business is also looked for from the pipe interests. A nearby agricultural implement manufacturer is asking for 400 tons of malleable for shipment from January to April, inclusive. Recent sales include a fair sized tonnage of Southern iron to a Western melter and 1000 tons of Southern No. 2 to an Indiana consumer, both for first half delivery, at $11, Birmingham. A central Ohio company took 500 tons of Northern No. 2 foundry for first quarter shipment at $14, Ironton. Practically all agencies are willing to take on business based on $11, Birmingham, for Southern, and $14, Ironton, for Northern No. 2 foundry, for shipment through the first half, but a number of furnace operators discourage soliciting business at these figures for delivery extending beyond March. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry	$14.75 to $15.25
Southern coke, No. 2 foundry	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern coke, No. 4 foundry	13.50 to 14.00
Southern coke, No. 1 soft	14.75 to 15.25
Southern coke, No. 2 soft	14.25 to 14.75
Southern gray forge	13.00 to 13.50
Ohio Silvery, 8 per cent. silicon	18.20 to 18.70
Lake Superior coke, No. 1	15.70 to 16.20
Lake Superior coke, No. 2	15.20 to 15.70
Lake Superior coke, No. 3	14.70 to 15.20
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	19.50 to 20.50

(*By Mail.*)

Coke.—There are some inquiries out for furnace coke that are expected to be closed soon. The aggregate tonnage asked for is around 20,000 tons per month, with deliveries running until July, and in one case through the entire year. Foundry coke is only a moderately good seller, and no long time contracts are reported, though there is a little spot business. There is considerable complaint against the railroads over delayed shipments, and coke moving from the Connellsville field appears slower in reaching its destination than from other sections. Several firms are doing a nice business in domestic coke, which commands a price of $3.50 to $4 per net ton at oven. Prices in all three fields are practically the same, furnace coke for spot shipment being obtainable around $1.50 at oven, and on contract between $1.65 to $1.85. Foundry coke for spot shipment is quoted at $2 and on contract around $2.25 per net ton at oven.

Finished Material.—There is very little new business reported, but the inquiry both for steel bars and structural material is better than some agencies expected. It is positively denied that there has been any cut on steel bars below 1.40c., Pittsburgh, and what business has come in lately was booked on this basis. Warehouse orders are very light, and prices range from 1.75c. to 1.85c. on both structural material and steel bars.

Old Material.—The Southern Railway is offering approximately 4000 tons of different kinds of scrap. Foundries continue buying sparingly and only to fill immediate requirements. Prices for delivery in dealers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$12.00 to $12.50
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	6.00 to 6.50
No. 1 cast scrap, net ton	11.00 to 12.00
Burnt scrap, net ton	8.00 to 9.00
Old iron axles, net ton	17.50 to 18.50
Old iron rails, gross ton	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton	22.50 to 23.50
Old car wheels, gross ton	12.00 to 13.00
Heavy melting steel scrap, gross ton	11.50 to 12.00

Birmingham

BIRMINGHAM, ALA., January 9, 1911.

Pig Iron.—The volume of inquiry in this market in the past week was quite satisfactory, general conditions considered, and the situation as a whole presents a more encouraging aspect. Sales since the first of the year are considerably larger than was expected, and in connection with these no figures lower than an $11 Birmingham basis are mentioned. Lots of 1000, 500 and 300 tons for shipment in the next three months have been booked. An effort to secure 800 tons of No. 3 foundry iron for shipment in January at 25 cents per ton below the $11 schedule is known to have been unsuccessful, while it is reported that two offers of $10.50 Birmingham have been refused for lots of 1000 tons each to be shipped promptly. The fact that stocks were reduced in December, notwithstanding the reduction in consumption, has been given serious consideration by the furnace interests, and in view of the present movement from furnace yards sellers predict the maintenance of an $11 Birmingham basis. In a number of cases the requirements of leading melters for the first half have taken definite form, and it is believed that when the status of prices is definitely known a large amount of iron will be taken. The principal inquiries now pending are from the pipe manufacturers, who, it is understood, will soon be offered sufficient tonnage for several months operations. There has been but little trading in warrants in this market recently, the owners of such holdings being unwilling to meet current prices.

Cast Iron Pipe.—A portion of the gas pipe required for Portland, Ore., was placed with the United States Cast Iron Pipe & Foundry Company in the past week. The business taken by other manufacturers, it is reported, consisted of comparatively small lots; the Portland letting is estimated at 12,000 tons and producers insist that better figures than anticipated were received. A contract to cover 6000 tons of water pipe for Portland is to be placed January 10. This is part of a total of 24,000 tons of water pipe expected to be required in the next 60 days for Western points. Local quotations are unchanged, but are considered firmer than at last report. We quote water pipe as follows per net ton, f.o.b. cars here: 4 in. to 6 in., $19; 8 in. to 12 in., $18 to $18.50; over 12 in., average $17, with $1 per ton extra for gas pipe.

Old Material.—Transactions of the past week indicate no improvement in conditions generally. The resumption of operations at local mills has not brought about a stronger demand and buying continues on the hand-to-mouth order. Asking prices of dealers are not changed, and we quote as follows, per gross ton, f.o.b. cars here:

Old iron axles	$14.00 to $14.50
Old iron rails	12.00 to 12.50
Old steel axles	14.00 to 14.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	9.00 to 9.50
No. 1 country	7.50 to 8.00
No. 2 country	7.00 to 7.50
No. 1 machinery	9.50 to 10.00
No. 1 steel	10.00 to 10.50
Tram car wheels	9.00 to 9.50
Standard car wheels	10.00 to 10.50
Light cast and stove plate	8.00 to 8.50

Announcement is made that the steel plant of the Tennessee Coal, Iron & Railroad Company, at Ensley, Ala., will be put in operation in the coming week. This plant was closed down December 23.

Buffalo

BUFFALO, N. Y., January 10, 1911.

Pig Iron.—Sales continue to run light, but an improvement in inquiry is noted. Probably 10,000 tons foundry grades are now under consideration by consumers in this territory, on which early decision as to closing is expected. A considerable portion of the inquiry comes from cast iron pipe makers, the bulk of it being from large interests. The price schedules reported last week are still maintained, as far as can be learned. We quote as follows for present and second quarter deliveries, f.o.b. Buffalo:

No. 1 X foundry	$14.50 to $15.00
No. 2 X foundry	14.25 to 14.75
No. 2 plain	14.25 to 14.50
No. 3 foundry	14.00 to 14.25
Gray forge	14.00 to 14.25
Malleable	14.50 to 15.00
Basic	14.50 to 15.00
Charcoal	17.50 to 18.25

Finished Iron and Steel.—The majority of the orders placed during the week were small, but they are coming along in fairly good volume. Specifications on tin plate contracts are commencing to come in a little more freely. The Canadian export trade is holding up well and orders of good size for billets and hoop iron have been placed recently A notable degree of activity is being maintained in structural material. The Eastman Kodak Company, Rochester, is this week calling for figures for three additional factory buildings, requiring between 500 and 600 tons of steel. Bids are soon to be received for structural material for Erie Barge Canal contract No. 14, on the Mohawk River Division, which covers 1200 tons of bridge work, 1500 tons of iron and steel for dams, lock gates, and valves, besides a considerable quantity of concrete reinforcing bars and 135,000 lb. of chain; also bids for the steel work required for contract No. 80. The Belmont Iron Works, Philadelphia, has

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been awarded the steel work, about 400 tons, required on contract No. 49. The Rochester Steel Company has the contract for structural steel for the factory to be erected by the Warsaw Improvement Company, at Warsaw, N. Y., for the Rochester Embury Company, about 100 tons, and the Buffalo Structural Steel Company was low bidder for the 300 tons for the first group of buildings for the Buffalo Orphan Asylum, for which bids were opened Wednesday of this week.

Old Material.—Some inquiry is noted for rerolling rails from outside districts. A few mills are now taking material a little more freely on contracts on which shipments were held up prior to the first of the year. Prices are practically unchanged on all grades except rerolling rails, which are now selling at about $15. We quote, as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$11.75 to $12.25
Low phosphorus steel	17.25 to 17.50
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Steel rerolling rails	15.00
Old steel axles	18.50 to 19.00
Old iron axles	23.00 to 23.50
Old car wheels	14.00 to 14.50
Railroad malleable	13.00 to 13.25
Boiler plate	9.75 to 10.25
Locomotive grate bars	10.50 to 11.00
Pipe	9.75 to 10.00
Wrought iron and soft steel turnings	7.00 to 7.25
Clean cast borings	6.25 to 6.50

St. Louis

ST. LOUIS, January 9, 1911.

The first week in the new year developed encouraging indications of an improvement in the demand for pig iron locally and in adjacent territory. An expansion in railroad development in the Southwest is now taking definite shape, mainly in Texas. The freight traffic of St. Louis for the past year approximated 51,961,190 tons, establishing a high record. The business of stove manufacturers for the past year was larger than for 1909.

Pig Iron.—A canvass of the leading sellers the past week developed the fact that while there was an improvement in the volume of inquiries, but one of the brokers secured important new contracts. Merchant sellers reported more doing in St. Louis territory, but the buying was of a hand-to-mouth character. The sales referred to above were 1200 tons of No. 1 soft Southern to an Iowa company; 1000 tons of No. 1 Northern to a stove manufacturer in St. Louis territory; 300 tons of high silicon Southern; all these contracts were for delivery over the first half. Another house sold various concerns 400 tons of No. 2 Southern foundry for shipment over the first half. No change in the market for Southern iron is noted, and we continue our previous quotations: No. 2 foundry for shipment over the first half, $11; for shipment over the second quarter, $11.25, f.o.b. Birmingham.

Finished Iron and Steel.—The leading interest reports an inquiry for 500 tons of standard rails. The inquiry for light rails is slower. For structural material the inquiry is confined to specific lots, both in local and St. Louis territory. There is a fair demand for steel bars, but the inquiry for track material is quiet.

Old Material.—There is no improvement of consequence in the demand. Such business as is passing is of a hand-to-mouth character and transactions among dealers. The St. Louis & San Francisco Railroad closed out a few cars of miscellaneous scrap and the Wabash Railroad a list of 700 tons. The market is unchanged from last week. We quote dealers' prices, per gross ton, f.o.b. St. Louis:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft	12.00 to 12.50
Relaying rails, standard sections, subject to inspection	24.00 to 24.50
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards, cut apart	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.00 to 18.50
Steel car axles	17.00 to 17.50
No. 1 railroad wrought	11.50 to 12.00
No. 2 railroad wrought	10.50 to 11.00
Railway springs	10.00 to 10.50
Locomotive tires, smooth	15.50 to 16.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	4.50 to 5.00
No. 1 busheling	10.00 to 10.50
No. 1 boilers, cut to sheets and rings	8.50 to 9.00
No. 1 cast scrap	11.50 to 12.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.00 to 8.50
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.00 to 7.50

Coke.—There is an improvement in the inquiry for coke, but not much new business developed during the past week except the sale of 1000 tons by one of the leading houses for shipment over the first half. The market is ruling steady, and we quote standard 72-hour Connellsville foundry at $2 to $2.25 per net ton, f.o.b. oven, according to quantity and delivery.

The German Iron Market

BERLIN, December 23, 1910.—The quiet tone has been observed in most lines of goods as the holidays approach. Trading on the Düsseldorf Exchange of a week ago brought no changes in prices. The calls for delivery of pig iron on order continue good, but the situation in the bar trade remains confused and therefore quiet. From the Luxemburg district the latest news is favorable; the tendency continues to improve slowly, with prices firmly held, and the export of pig to Belgium has gained somewhat in activity. From the Siegerland region an improvement is also reported. All the ore mines are working at full capacity, and the stocks of ores at the mines, which had reached considerable volume until quite recently, will soon be cleared off entirely. Above two-thirds of the 33 furnaces in that region are in blast, and several more will be blown in at the beginning of the new year. From the Essen district, too, an increase in the output of pig iron appears probable, it having been announced this week that the great Phönix Company has just blown in another new furnace at its Kupferdreh plant. A new turn in the pig iron market may be looked for if the news received from Siegen this week proves correct, according to which the furnaces in that region are again in negotiations with the Essen Syndicate in regard to joining it; it is even reported that the union will be effected within a few days.

From the Silesian district a quiet state of business is reported. Consumers of steel material are backward in sending in specifications. Business there in thin sheets is quite good, but the amount of work in heavy plates is much less than the mills can manage. The pig iron trade is in good shape, with hardly any accumulation of stocks.

The event of the week was a meeting of the Steelworks Union in Düsseldorf, December 20, to take action on petitions for an increase of the allotments in bars, plates, wire rods and wrought pipe. It was decided to add 10 per cent. to the allotments in pipe, but to make no change in the other lines mentioned. At this meeting the union gave out its usual monthly summary of the market situation. It says that the calls for delivery of goods in the home market remain satisfactory, and that the amount of orders taken for the first quarter of 1911 guarantees good shipments for that period. Specifications are coming in from abroad at a satisfactory rate, and better business is expected from the English shipbuilding industry, now that work has been resumed there in full. The union expresses grave doubt as to whether the Prussian railroad authorities will make the usual supplementary orders for rails and ties in January; and since the report was issued it has grown practically certain that such orders will not be placed. The foreign market continues to show a good demand for heavy rails, and further considerable amounts have been ordered, while negotiations are in progress for some large orders. In grooved rails some good home and foreign orders have been placed, although this is usually a very quiet season for that specialty. The trade in structural shapes is quieter, but greater activity is looked for within a month or two. The foreign market is ordering structural shapes in satisfactory amounts, and is also sending in specifications at a brisk pace.

Germany's exports of iron and steel in November suffered a considerable backset as compared with October. The November outgo amounted to 392,235 metric tons, which compares with 426,262 tons for October. The exports of pig iron, which had been unusually heavy for several months, also underwent a reduction in November, showing a total of 66,625 tons, or 8,172 tons less than for October. The net excess of exports over imports last month was smaller than for any other month since February; it was 342,300 tons, as compared with 375,718 tons in October.

For 11 months the exports of iron and steel amounted to 4,394,000 tons, against 3,617,000 tons last year; while imports reached 510,000 tons, against 418,800 tons. The export excess was 3,884,000 tons, against 3,198,000 tons last year.

BERLIN, December 30.—Only in certain sections of the trade where price cutting is going on does buying seem to be more active. This is true of the export business in bars, which is very brisk. At the beginning of October an export drawback of 6 marks a ton went into force, to hold till the end of March; and this, along with the cutting of prices, has caused a very active trade for export. It is understood that German bars of soft steel can now be bought, delivered on board ship, at 95 to 97.50 marks per ton. Business in

THE IRON AND METAL MARKETS

bars for home delivery, however, remains sluggish. A meeting is to be held about the middle of January to decide whether the price convention, which expires at the end of March, shall be prolonged.

The opinion appears to prevail that the last report given out by the Steel Works Union was too optimistic. It is pointed out that the union mills have for a long time been unable to dispose of more than 80 per cent. of their allotments in class A goods (billets, structural shapes and rails), and it is reported that various members are still trying to get increased allotments in other products, or to get some of their allotment in class A goods shifted to class B (including bars, plates, wire rods, tubes, &c.).

New York

NEW YORK, January 11, 1911.

Pig Iron.—More inquiry has come out in the past week with occasional purchases. A New England valve manufacturer has bought 800 tons, and the electric company that has been in the market for two months made further purchases for two plants. Three inquiries of 1000 tons are pending, one being for charcoal iron and another coming from a railroad supply company. Closer competition is reported on business out of Buffalo, quotations on shipments to the East having again gone below $14 for No. 2. Reductions of wages at several eastern Pennsylvania furnaces are likely to be followed by others. We quote for tidewater delivery as follows: Northern No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $14.75; Southern No. 1 foundry, $15.50 to $15.75; No. 2, $15.25 to $15.50.

Finished Iron and Steel.—Internal affairs mainly have occupied the attention of the industries of late and little new business has been transacted. The prospect is quite generally believed to be good. Manufacturing consumers are busy, the railroads have need of considerable material and in structural lines a great deal of new work is planned, much is already financed, in many cases sites are cleared, and why orders are withheld is the question; but the commonest explanation is that lower prices are waited for. It is thought that many decisions will be reached after the results of the conference of steel manufacturers to-day become known. Meantime all lines are quiet. Iron bar orders are reported better the past week and plates seem to be in slightly better demand. The Southern Railway is in the market for 5000 kegs of spikes. The award on the plates for the battleship to be built in the New York navy yard is indefinitely held up. The act authorizing the building of the two battleships will have to be amended either to increase the appropriation for the building of the one by the Government or to allow both to be built by private builders. None of the principal contracts pending for structural work have been closed. The Jones & Laughlin Steel Company has taken a bridge of 450 tons for the Pittsburgh & Lake Erie and will also furnish 1200 tons of reinforcing bars for Panama Canal construction. Bids were received January 7 on 1400 tons for a factory building for the Edward Ford Plate Glass Company, at Rossford, near Toledo, Ohio; January 9 on 1400 tons for pier 14 for the New York Central, and on 800 tons for the Consolidated Gas Company for a building at Seventeenth street and Fifth avenue, and January 11 on about 300 tons for a warehouse for the Warner Sugar Refining Company, at Edgewater, N. J. The Philadelphia & Reading has taken bids on 400 tons for a coal pocket and ash pit at St. Clair, Pa. Present price quotations are as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.35c. to 1.40c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

Ferroalloys.—There is an absence of demand for ferromanganese. It is quoted at $38, Baltimore, for spot delivery, and $38.50 for delivery over the first half. Some fair sized sales of 50 per cent. ferrosilicon have been made at $55.50 to $56, Pittsburgh.

Cast Iron Pipe.—Lowell, Mass., will open bids to-day on 350 tons of 8 to 10 in. water pipe. No other public lettings of importance have developed in this vicinity. Pipe manufacturers, however, are feeling much more cheerful as the result of increasing inquiries from private consumers, particularly gas companies, for spring delivery. Many more buyers of this character are in the market than two or three weeks ago. While carload lots of 6-in. can still be obtained at $22 per net ton, tidewater, some of the manufacturers are firmer in their views and are not willing to meet this price.

Old Material.—While transactions are light, dealers manifest a somewhat better feeling, being inclined to the opinion that the extreme depression has passed. They look for an improved demand from this time forward. Cast scrap is doing a little better, with fair inquiries coming out. Stove plate is in rather better demand than heavy cast. Some inquiries are being received for wrought scrap. The only transactions in heavy melting steel scrap have been purchases of small lots for filling in on old orders, and on such business better prices have naturally been obtained than would have been the case if the scrap had been forced on the market. As the inventory season is now over, consumers quite generally have ordered dealers to resume shipments on contracts. Quotations, per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting	$10.00 to $10.50
Heavy melting steel scrap	10.00 to 10.50
Relaying rails	20.50 to 21.50
Standard hammered iron car axles	20.50 to 21.00
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.75 to 12.25
Wrought iron track scrap	10.75 to 11.25
No. 1 yard wrought, long	10.50 to 11.00
No. 1 yard wrought, short	10.00 to 10.50
Light iron	5.00 to 5.50
Cast borings	5.50 to 6.00
Wrought turnings	5.25 to 5.75
Wrought pipe	9.50 to 10.00
Old car wheels	11.50 to 12.00
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.50 to 10.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	12.00 to 12.50

Metal Market

NEW YORK, January 11, 1911.

THE WEEK'S PRICES

Cents Per Pound.

	Copper.			Lead.		Spelter.	
Jan.	Lake.	Electrolytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
5	13.00	12.75	39.60	4.50	4.35	5.55	5.40
6	12.87½	12.62½	39.25 to 39.45	4.50	4.35	5.55	5.40
7	12.87½	12.62½	....	4.50	4.35	5.55	5.40
9	12.87½	12.62½	40.30	4.50	4.35	5.55	5.40
10	12.80	12.60	40.50	4.50	4.35	5.55	5.40
11	12.75	12.50	40.50	4.50	4.35	5.55	5.40

Pig tin is higher than at any time since 1907. Copper is much weaker. Spelter continues weak, but its decline has for the time been checked. Lead is firm but dull. Antimony has advanced sharply.

Copper.—The report of the Copper Producers' Association, showing the increase in the December production, created a decidedly unfavorable impression and prices declined. Holders of copper are apparently becoming restless, and this morning electrolytic was freely offered at 12.50c., which is ¼c. less than was asked last week. Consumers are not anxious to buy, even at the reduced quotation. Prices on lake copper vary, but the majority of sellers are asking 12.75c., although certain brands cannot be had for less than 13c. The London market has also weakened. The exports of copper so far this month amount to 9493 tons. In London to-day spot copper sold at £55 7s. 6d. and futures at £56 3s. 7d.

Pig Tin.—Sales of pig tin have been made the past week at higher prices than at any time since 1907. A strong buying movement developed on Friday, when the market opened 30 points lower than on the previous day on the strength of a lower price cabled from London. Consumers immediately took advantage of the reduction and about 500 tons was bought at prices ranging from 39.25c. to 39.45c. It was largely for January and February consumption and it was apparent from the eagerness shown by the purchasers that many of them were very badly in need of a supply. There has been an absence of speculative buying between dealers, as most of them are afraid of the market. The market opened on Monday 85 points higher than the highest quotation of Friday, and yesterday the price went to a record figure—40.50c. for spot tin. Very little buying has been done since Monday. The impression prevails that higher prices may be looked for, as there are no signs of weakness in the London syndicate's hold on the market and stocks in America are closely concentrated. The arrivals of tin so far this month have been 1482 tons and there are 2031 tons afloat. Pig tin was sold in New York to-day for 40.25c. In London to-day spot pig tin was selling at £183 10s., and futures at £184.

Tin Plates.—As the result of the prevailing high price of pig tin, quotations on tin plates at Swansea, Wales, were advanced 3d., according to this morning's cable from London, now being 14s. 7½d. The market in domestic tin plates is quiet, but a demand from the can manufacturers is expected to develop in the near future. The quotation for 100-lb. coke plates is $3.84.

Lead.—Consumers are taking no interest in the lead market, but prices are held firmly. The Price in New York is 4.50c., and in St. Louis, 4.35c.

Spelter.—Spelter prices remain unchanged, this being the first time in three weeks that there has been no decline. Buyers are taking no interest in the market and quotations are in a large measure nominal. A great deal of stocks have

THE IRON AND METAL MARKETS

been accumulating in the hands of sellers, but they show little disposition to make further concessions. On the other hand, many consumers are stocked up with metal bought at higher prices than now prevail, so that the market is an unsatisfactory one for both sellers and consumers. Quotations in New York are 5.55c., and offerings are made in St. Louis at 5.40c. These prices may be shaded.

Antimony.—A reaction has taken place in the antimony market, which has been in a neglected shape for the last three months. It was in bad condition last Thursday, and there were reports of offerings of round lots of both Hallett's and Cookson's at 7½c. The following day the sellers suddenly changed front. Hallett's was advanced to 8c. and Cookson's was put up to 8.25c. It is apparent that producers of antimony abroad have reached some understanding as the sellers here who advanced quotations admitted that they were acting under advices from Europe. Chinese brands are now offered at about 7.50c. and Hungarian grades from 7c. up.

Old Metals.—While the market is weak, dealers' selling prices are nominally unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.25 to 12.50
Copper, heavy and wire	11.75 to 12.00
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.25 to 8.50
Brass, light	7.00 to 7.25
Heavy machine composition	11.00 to 11.25
Clean brass turnings	8.00 to 8.25
Composition turnings	9.00 to 9.50
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc scrap	4.30 to 4.40

Metals, Chicago, January 10.—A fair amount of copper is being sold, chiefly for prompt delivery. The lead market is a little firmer, as outside smelters who have been shading heretofore have brought their prices up to the level of quotations by the leading interest. Spelter is a little stronger, but without changing the price quoted last week. Tin is so erratic that printed quotations are of little value as a guide to the market. We quote Chicago prices as follows: Casting copper, 12⅞c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 41c.; small lots, 43c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.50c. to 5.55c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c., in small lots; sheet zinc is $7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 12c.; red brass, 10½c.; yellow brass, 9c.; lead pipe, 4⅜c.; zinc, 4¼c.; pewter No. 1, 26c.; tin foil, 30c.; block tin pipe, 33c.

Metals, St. Louis, January 9.—Lead is steady at 4.37½c.; spelter is firmer, but unchanged, at 5.40c., both at East St. Louis. Zinc ore is steady at $38 to $40 per ton, Joplin base. There is some curtailment in the output. The new lead smelter at Webb City is now in operation. Tin is higher and quoted at 39.75c. per pound; antimony (Cookson's) unchanged at 7.85c.; lake copper is steady at 13.22½c.; electrolytic unchanged at 13.05c., all at St. Louis. The demand for finished metals the past week was quite satisfactory.

Iron and Industrial Stocks

NEW YORK, January 11, 1911.

The stock market maintained its strength until yesterday, and all prices from day to day showed quite a gain over the corresponding part of the previous week. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	8 - 8¼	Pressed St., com..	30⅞- 32½
Allis-Chalm., pref..	27⅝- 29	Pressed St., pref..	92¾- 93½
Beth. Steel, com..	29¼- 30⅝	Railway Spr., com.	32 - 33½
Beth. Steel, pref..	59 - 60½	Republic, com.....	31¼- 32¾
Can, com.....	8⅞- 9¼	Republic, pref.....	93 - 93⅞
Can, pref.....	77 - 79¼	Pipe, com.....	15
Car & Fdry, com..	51¼- 52⅞	Pipe, pref.....	50½- 52½
Car & Fdry, pref..	115 -118	U. S. Steel, com...	73¾- 75½
Steel Foundries...	44 - 45¾	U. S. Steel, pref...	117¼-118⅜
Colorado Fuel.....	31⅛- 32½	Westinghouse Elec.	66⅜- 66¾
General Electric...	151 -153⅜	Va. I., C. & C.....	52 - 52⅞
Gr. N., ore cert....	56 - 58½	Am. Ship, com.....	76½
Int. Harv., com...	111 -112¾	Am. Ship, pref....	110¼-110¾
Int. Harv., pref...	122¼-123	Chi. Pneu. Tool...	41⅝- 43
Int. Pump, com...	40¾- 41½	Cambria Steel.....	42½- 45⅜
Int. Pump, pref...	85 - 85¾	Lake Sup. Corp...	29 - 29¾
Locomotive, com..	39⅛- 40½	Warwick	10
Locomotive, pref..	106¼	Crucible St., com..	12 - 12⅝
Nat. En. & St.,com.	17 - 17½	Crucible St., pref..	74 - 75⅝
Nat. En. & St.,pref.	83¾- 85	Harb.-W. Ref., pref..	95

Dividends.—The Harbison-Walker Refractories Company, Pittsburgh, has declared the regular quarterly dividend of 1½ per cent on the preferred stock, payable January 20.

The Columbia Welding Machine Company, Pittsburgh, has declared semi-annual dividends of 4 per cent. on the preferred and common stock, both payable January 20.

Notes on Prices

Rope.—Market conditions remain unchanged, buying being along conservative lines and in entire conformity with the needs of the trade. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with card advances for smaller sizes: Pure Manila of the highest grade, 8¾c. to 9c. per pound; second grade Manila, 7¾c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure sisal of the highest grade, 6¾c. per pound; second grade, 6¼c. per pound; jute rope, ¼-in. and up, No. 1, 6c. to 6¾c. per pound; No. 2, 5½c. to 6c. per pound.

Linseed Oil.—The oil market is stronger in so far as higher prices are generally asked for spot oil in carload lots than the quotations made for two or three weeks previous. Foreign crops of flaxseed have not come up to the volume of former years nor up to this year's estimates. This has naturally caused an advance in the price of domestic seed. The following quotations represent New York prices in 5-bbl. lots or more:

	Cents.
State, raw	91
City, raw	91

Linseed, in lots less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon.

Spirits Turpentine.—While there was an increase in demand at this point early last week, trading since that time has not been so active. Prices advanced slightly at this point and also at Savannah, where the larger interests have for some time been absorbing the bulk of the receipts in turpentine. New York quotations in 5-bbl. lots are as follows:

	Cents.
In oil barrels	82
In machine barrels	82½

Less than 5-bbl. lots, ½ cent advance per gallon.

The announcement is made that *Cement Age* of New York, and *Concrete Engineering* of Cleveland, two of the leading monthly publications in the cement field, have been consolidated. Allen Brett, editor of *Concrete Engineering* for the past two years, will take the position as associate editor of the new publication, and Arthur E. Warner, formerly business manager of *Concrete Engineering*, will become Western manager. There will be no change in the present staff of *Cement Age*, Robert W. Lesley continuing as editor, Frederic F. Lincoln as president of the Cement Age Company, in charge of the New York office at 30 Church street and of the Eastern advertising field, and Edward A. Trego as associate editor.

A new Hower Building will be erected in Akron, Ohio, on the same site as the one destroyed by fire in 1909. It will be eight stories, of concrete and heavy steel construction. The first five floors have been leased by the Hardware & Supply Company, which will expend $30,000 for interior furnishings, making it one of the best equipped storerooms of its kind in the State. The basement floor will be connected with a switch from the Belt Line Railroad so that cars can be run into it. The building will be equipped throughout with automatic sprinklers, and will be provided with a 5-ton freight and passenger elevator.

The Bureau of Manufactures of the Department of Commerce and Labor, Washington, D. C., is establishing a file of the names of American manufacturers and traders, for use in distributing the valuable information which reaches it from time to time in regard to foreign trade. Those who desire to avail themselves of the facilities thus offered for extending their trade abroad should send to the bureau their names and advise it as to the class of business in which they are engaged.

The Pittsburgh plant of the American Sheet & Tin Plate Company at New Kensington, Pa., containing eight hot mills, was started up on Tuesday, this week, after being idle for several months.

New Tools and Appliances

This is essentially a news department for which information is invited.

Thread Milling Attachment.—The Garvin Machine Company, Spring and Varick streets, New York City, is equipping its milling machine with a new thread milling attachment, which enables single and multiple threads within a wide range to be cut easily and rapidly. The spindle on the attachment runs in a long rigid bearing mounted on the machine table, and drive for the spindle is from the milling machine spindle through a sprocket and chain drive to the maker's standard gear box at the back of the machine. From the gear box power is transmitted through the usual universal joints and shafts to the table screw. Spindles for lathes and milling machines are forced on the taper nose of the attachment and supported by an adjustable steady rest. Two recent pieces of work handled were the threading of a milling machine nose 2½ in. in diameter and ¾ in. long in 7½ minutes, and another 5 in. in diameter and 1⅜ in. long in 22 minutes, the number of threads being four per inch in each case.

Combination Bench and Pipe Vise.—The Armstrong Mfg. Company, 297 Knowlton street, Bridgeport, Conn., has placed on the market an improved design of quick adjusting combination bench and pipe vise. The pipe vise has four hardened steel serrated V-blocks, and the rear jaw is free to slide along the base and is held in position by a pin which engages holes in the base. These holes furnish three positions for the jaw, and when the pin is in the first hole the capacity of the vise is for pipes ranging in diameter from ⅛ to 1 in. Moving the jaw to the second position increases the capacity up to 2 in., and when in the third position 2½ or 3 in. sizes can be gripped. These changes are easily and quickly made. It also has sockets for legs, so that a stand can be made if desired.

A Ferracute Internal Notching Press.—For notching field laminations and other internal work, the Ferracute Machine Company, Bridgeton, N. J., is building a press for handling work as large as 24 in. in diameter. A special type of carriage is employed, and upon this a ring is mounted which is known as the ratchet holder and runs in adjustable bearings. Another ring, the internal diameter of which fits the outside of the disk to be notched is doweled to the ratchet holder. A pawl lever is attached to the carriage and rotates the work. Two sizes of ratchet holders are used with this machine, the smaller for work having an external diameter of from 6 to 15 in., and the larger for disks, the outside diameter of which ranges from 15 to 24 in.

The Garvin Worm Hobbing Attachment.—The Garvin Machine Company, Spring and Varick Streets, New York City, has developed a hobbing attachment for worm sectors which is intended to be applied to one of its milling machines. In operation the hob is mounted in the spindle of the milling machine and has geared to it a long worm of the same pitch and running at the same speed. This worm meshes with a worm wheel having the same diameter as the sector to be cut, and this wheel and the sector are mounted between centers on the same mandrel. At the commencement of the work the table of the milling machine is run in close to the column and a blank segment put on the mandrel. The machine is then started and the automatic cross feed thrown in. The taper hob enters the work gradually, and when the table has moved to the other extreme of its travel the work is finished.

Roll Grip Mandrels.—A recent product of the Jaeger & Sword Mfg. Company, Millbrook, N. Y., is a simple and ingenious mandrel, in which a roll is inserted and set so as to grip the work very positively. This form of mandrel possesses the advantage on such work as gear blanks, collars, bushings, pulleys, &c., of eliminating the tailstock on small pieces and permitting the work to be set up with the smallest possible delay. When machining work to a given length, these mandrels will allow the cutting tool to cut clear across.

The Firth-Sterling Steel Company, McKeesport, Pa., on December 31 placed the management of its Pittsburgh sales office in the hands of E. S. Jackman & Co., who have been its agents in all the States west of Pennsylvania for the past 10 years. D. G. Clark, of the firm of Jackman & Co., who has had charge temporarily of the company's sales office in the Westinghouse Building, will remain as resident manager, but with headquarters in the Henry W. Oliver Building. Mr. Clark has associated with him John Daker, Sr., A. E. Barker, W. R. King and W. P. Becker.

H. M. Byllesby & Co., Chicago, have acquired control of a number of additional public utility properties in California, including the electric and gas properties of the Stockton Gas & Electric Corporation, the electric light and power business at Richmond and the gas and electric properties at Eureka. The American River Electric Company and the Humboldt Gas & Electric Company are also included in the purchase. A new company known as the Western Gas & Electric Company has been formed to hold these properties.

The Alliance Engineering & Sales Company, incorporated for $50,000, has been organized in Milwaukee, Wis., to acquire the patents and exclusive sales agencies of the Reliance Engineering & Equipment Company, and is now carrying on that branch of the business. F. G. Bolles, until recently commercial engineer of the Allis-Chalmers Company, is the principal stockholder. The consulting work will be retained by the old company under the management of C. A. Tupper.

Joint offices have been opened in the McCormick Building, Chicago, by the Detroit Seamless Steel Tubes Company, Michigan Malleable Iron Company and Monarch Steel Castings Company, all of Detroit, for the sale in the West and Southwest of Detroit locomotive flues, Detroit journal boxes and Monarch couplers. Walter E. Marvel, formerly manager of the St. Louis office of the Buda Company, has been appointed Western sales manager in charge of the Chicago offices.

The Eastern offices of the American Electric Fuse Company, which have been located at 116 Nassau street, New York City, for nearly 12 years, have been removed to more commodious quarters in the Hudson Terminal Buildings, room 1766. George B. Dusinberre, formerly in charge of the Cleveland branch, has been transferred to the New York office as manager, succeeding W. B. McCurdy, resigned.

The Treasury Department has issued regulations covering the allowance of the usual drawback in duties paid on steel shanks manufactured by John M. Carrecabe, Boston, Mass., with the use of imported steel in strips of not less than No. 15 wire gauge, and on wire rope manufactured by the Pacific Wire Rope Company, Los Angeles, Cal., from imported steel wire.

Reports made at the annual meeting of the Burt Mfg. Company, Akron, Ohio, maker of ventilators, showed that the company did more business in 1910 than in any previous year in its history. The company has under consideration the building of a large fireproof warehouse, which will probably be erected in the spring. W. F. Warden was re-elected president and general manager.

Coke production in the Connellsville field for the past year made a new high record. The total output for 1910 was 20,168,012 net tons, as against the previous year's total of 17,783,832 tons. The year 1906 had held the record up to this time with an output of 19,999,326 tons.

The Crager Wire & Iron Works, Salt Lake City, Utah, has been incorporated with $50,000 capital stock, to take over the business of the firm of the same name. The company manufactures ornamental wire and iron work.

The Machinery Markets

With the gradual clearing up of the extensive inventory work in most manufacturing plants, a better inquiry for equipment has developed in the machinery trade. The automobile shows in New York are bringing some business into that market, and there are some good lists out in New England that give promise of immediate orders. In Pittsburgh there is an increased demand for machinery used by public service corporations, and there is a good inquiry for electric equipment in the Cleveland market. Rather quiet conditions prevail in Cincinnati where inventory work is still affecting trade. In the South municipal contracts are attracting the attention of the machinery dealers. A few railroad inquiries have come out in the Chicago market, and the indications there are that the carrying companies will be obliged to buy soon, as their motive power is not in the best condition. Milwaukee dealers are delivering equipment against orders placed some time ago, for a number of plants now under construction and additional buying is expected on these accounts.

New York

NEW YORK, January 11, 1911.

The automobile show season is on in New York and many manufacturers of machine tools and other metal working machinery, in addition to makers of drop forgings and automobile parts, are visiting the city. This has brought some business into the New York market, as many of them have taken occasion to call on the trade here, and a number of fair orders have been placed for machinery. The automobile people are also buying a machine here and there for replacement, and there has been more selling from stock by New York houses during the last week than at any time during the last two months. Inquiries from other sources are not large, however, and so on the whole trading was not particularly good during the week. Most of the inventory work in manufacturing plants in this district has been concluded, and consequently a better demand for equipment is expected to develop within a short time. The railroads are buying very sparingly, picking up only an occasional tool for replacement. Business in the heavy power equipment line is not very satisfactory. It is stated that there has been some price cutting in that field of late by engine manufacturers who took orders at a minimum of profit with a view to keeping their plants busy.

The Westinghouse, Church, Kerr Company, 10 Bridge street, New York, has been awarded a general contract for the construction of a large extension to the plant of the Westinghouse Electric & Mfg. Company at Orange and Plane streets, Newark, N. J. The extension will consist of two L's, each 75 x 100 ft., and five stories. An addition will also be made to the present power house, and a large part of the space in the new structures will be devoted to warehouse purposes.

The Cockburn Company, Monmouth and Twelfth streets, Jersey City, N. J., has been incorporated, with an authorized capital stock of $50,000, to take over the business of the Cockburn Barrow & Machine Company, manufacturer of contractors' machinery, with a plant at the address given above. J. S. Harris is president of the new company.

Bids will be opened January 18 by the Department of Water Supply, Gas and Electricity of the city of New York at its offices, 13 Park row, for furnishing portable engine driven air compressors and centrifugal pumping units. Forms for making estimates can be obtained at the office of the department.

The car and locomotive repair shops to be built by the Delaware & Hudson Company at North Albany will comprise a locomotive repair shop 275 x 300 ft., a blacksmith shop 100 x 300 ft., a boiler and tank shop, woodworking shop, car repair shop, testing laboratory, a 35-stall roundhouse, a general storehouse and an administrative building. The estimated cost of the improvements is about $2,000,000.

The Buffalo Receptacle Company, Buffalo, N. Y., recently incorporated with a capital stock of $150,000, has purchased a factory at 1490-1494 Jefferson street and will equip it for the manufacture of refuse receptacles, garbage cans and other sheet metal specialties. Gustave Steinwach, manager, 1047 Genesee street.

The Federal Motor Company, Buffalo, N. Y., is having a factory building erected at Main and Northampton streets, four stories, steel frame and brick, with 63,000 sq. ft. of floor space, which it will equip for the construction of motor trucks and commercial vehicles. E. E. Denniston is manager, 184 West Mohawk street.

The Cartridge Carbon Company has been incorporated at Rochester, N. Y., with a capital stock of $100,000, to manufacture and deal in carbon paper, typewriter ribbons, &c. The incorporators are E. Bostwick, J. C. Stoll and F. B. Bishop, all of Rochester.

Chicago

CHICAGO, ILL., January 10, 1911.

It is a little early to get a definite line on machine tool business for 1911, as buyers are not all through checking their inventories and January business has hardly begun. The inquiries pending would make a fair amount of business if the parties figuring on new tools go ahead and close. A few of the large dealers have inquiries from railroads which are of an encouraging character. The motive power of Western railroads is generally in such bad condition that machinery men cannot give up hopes of a buying movement by the railroads which would prove an important factor in the market. The railroads, however, have disappointed all the prophets and no one knows how much longer they may be able to go with leaky and crippled engines and patched up cars. The car shops of the average railroad would furnish material for an embarrassing discussion, on account of their lack of modern tools and labor saving equipment, as many of them are still running with the equipment they bought 30 or 40 years ago, when the shops were built.

A more encouraging feature of the trade is the amount of inquiry from metal working manufacturers. Buyers of this class have been going slow for the past year, and their needs in the way of new tools have been accumulating.

Sealed proposals will be received by the city of Chicago, January 19, 1911, at Commissioner of Public Works office, City Hall Building, for furnishing and installing in place two 20,000,000-gal. centrifugal pumps and two 1000-hp. synchronous motors, together with piping, wiring, switchboard and other appurtenances, at the Twenty-second street pumping station.

The Ferguson & Lange Foundry Company, Chicago, has increased its capital stock from $50,000 to $100,000.

The Roth Mfg. Company, Chicago, has increased its capital stock from $24,000 to $100,000.

The Crown Electrical Mfg. Company, St. Charles, Ill., has about completed the erection of an addition to its foundry, for which the necessary equipment has been purchased.

The Peoria Metal Culvert Company, Peoria, Ill., recently incorporated with $40,000 capital stock, has erected a new factory building and has its equipment installed ready for operation.

The Hunt-Helm-Ferris Company, Harvard, Ill., manufacturer of the Star line of hay tools, tank heaters, hand sleds, door hangers, &c., is considering the erection of a new factory, plans for which have not been worked out.

The Ville Engineering Company, Moline, Ill., has been incorporated with a capital stock of $200,000. The incorporators are Willard L. Ville, Lawson M. Fuller and Otis E. Mansur. The company will engage in the manufacture of electric motors, engines, automobiles, &c.

The German-American Portland Cement Company, La Salle, Ill., has plans in progress and will probably start work early in the spring on a new cement plant to be erected at a probable cost of $750,000.

A. H. Loeb, Chicago, vice-president Sears, Roebuck & Co., is having plans prepared by Jenney, Mundie & Jensen, 171 La Salle street, for a five-story manufacturing building which has been leased to the Troy Laundry Machine Company.

Pittsburgh

PITTSBURGH, PA., January 10, 1911.

With the opening of the new year a decidedly hopeful feeling prevails here. So much of the machinery used by public service corporations in the United States, Canada and Mexico, as well as elsewhere throughout the world, is manufactured in this district, that the situation has always been

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very materially affected by the market for securities, and in this respect prospects for the immediate future are most encouraging.

Many extensions and plant improvements that are known to have been under consideration for the past few months will also be definitely determined upon this month, at the various directors' meetings to be held, and orders for equipment will follow. For some of these enterprises the selection of the apparatus needed has, however, already been made, subject to the granting of official authority for its purchase.

While no official announcement on the subject has been made, and the work will in each instance be taken up as a separate local development, it is known here that the West Penn Electric Company, whose operating offices are at Connellsville, Pa., has outlined extensive improvements and additions to be made to its various generating and distribution systems during the coming year. These cover an area much greater than that served by any other industrial power and lighting company in the world, and through its efforts the use of electric motors for driving machinery is being widely extended in the districts traversed by its lines. The communities served include Connellsville, Scottdale, Mt. Pleasant, Greensburg, Vanderbilt, Jeanette, Manor, Uniontown, Brownsville, West Brownsville, Charleroi, Lucyville, Bridgeport, Donora, Coal Center, Derry, California, Everson, Roscoe, Dawson, Elizabeth, West Elizabeth, Fairchance, Fayette, Latrobe, Monongahela, Monessen, New Haven, New Salem, Masontown, Finleyville, Youngwood, Youngstown, Stockdale, Speers, Allenport, McMahon, Allen, Belle Vernon, Carroll, Courtney, Dravosburg, Elco, Greenville, Irwin, Smithfield, West Newton and Pittsburgh itself, as well as towns adjacent and a number of street railway systems. The company's general offices are in the Bank for Savings Building in Pittsburgh.

The Baldwin Tool Works is preparing to remove from Columbus, Ohio, to the new plant at Parkersburg, W. Va., which will give it manufacturing facilities much more extensive than those heretofore available. The company has recently taken out a new charter, with capital stock of $300,000.

There appears to be no truth in the statement recently given currency that the Baltimore & Ohio Railroad Company will proceed with plans for new repair shop facilities at Brooklyn, W. Va., in the near future. The improvement is, however, needed and will probably be taken up as early as practicable.

A compressor plant and distribution system will be constructed by the Tri-County Natural Gas Company, Pittsburgh, of which J. C. McDowell is general manager. The company is reported to be incorporated for $1,200,000, and bonds for $600,000 will be sold to provide the necessary equipment.

With the present ratio of gain in the demand for the reinforcing frames of which the Pittsburgh Steel Products Company, Pittsburgh, makes a specialty, increased shop facilities, including the electric plant for welding these frames, will need to be provided during the year.

The Backus Novelty Works, Pittsburgh, is reported to be planning the construction of a manufacturing plant at Smethport in McKean County, Pa.

Bids have just been taken by the Orenstein-Arthur Koppel Company on the new buildings for its works at Koppel, Pa., including a wood-working shop 50 x 100 ft., machine shop 75 x 75 ft., erection shop 50 x 220 ft., and heavy car shop 75 x 140 ft. There will also be an outside crane runway 40 x 275 ft. and a separate power plant. The company's chief engineer, whose office is in the Machesney Building, Pittsburgh, will be in charge of the construction, assisted by F. G. Rose, consulting engineer.

All of the electrical machinery and auxiliary apparatus for the 18,000 kw. power development of the Eastern Tennessee Power Company at Parksville, Tenn., will be furnished from the shops of the Westinghouse Electric & Mfg. Company, Pittsburgh.

Agitation for a municipal electric plant has been started here, and its adherents expect to bring the matter to an issue by spring. Should such a plant be constructed, the city will need to purchase a very extensive line of equipment in order to meet the needs of the service. No decisive action is, however, likely to be taken during the present year.

The Commercial Water Company, Beaver Falls, Pa., is preparing to build a dam across Dry Run and construct a pumping station for distributing the water thus impounded. A hydro-electric development may also result, although the city is at present supplied by the Valley Electric Company of New Brighton, Pa.

The Climax Mfg. Company, Corry, Pa., which builds an improved type of geared locomotives for industrial service, has experienced a good demand the past year from logging roads, particularly in the mountainous district, as its machines are especially adapted to steep grades, sharp curves and uneven road beds. It is stated locally, although without direct confirmation, that a larger output will be provided for in 1911.

Work has been started at Youngstown, Ohio, on a shop of moderate capacity for the Youngstown Bronze & Foundry Company.

The J. F. Johnson Company, Huntington, W. Va., is preparing to erect a saw mill and power plant on a tract of timber which it owns.

Philadelphia

PHILADELPHIA, PA., January 10, 1911.

The first week of the new year was not very productive of fresh orders. Merchants generally report business quiet, a few scattering orders for small tools making up the bulk of that placed. While there is a fair amount of prospective business, little has been under immediate negotiation. There has been no further inquiry from railroad companies, and a canvass of the buyers by the trade fails to bring out any definite information as to when business beyond current demand for an occasional tool or a few tools for replacement purposes will develop. The larger industrial concerns do not promise any early buying of consequence, as in nearly all cases present equipment is not fully employed. Manufacturers continue to report business as irregular and maintain operations at an unchanged basis. Makers of special equipment are, as a rule, more actively engaged than those who are manufacturing the standard types of equipment.

The second-hand machine tool trade continues irregular and inclined toward quietness. Little new business is coming to the builders of engines, although those making equipment of the heavier type are somewhat better engaged. While there has been a shade better demand for steel castings, gray iron foundries, particularly those making a specialty of machinery castings, are not so actively engaged.

An application for a charter has been made under Pennsylvania laws by George B. Atlee, Mayer Schamberg, Morris Ebert, W. L. Allen, Wilson Woelpper and others for a corporation to be known as the Northeastern Street Railway Company to construct an electric street railroad from Frankford avenue and Bridge street, in Frankford, Philadelphia, to the county line or Poquessing Creek, passing through Bustleton, Sommerton and Byberry. The formal application will be made January 27.

The Weimer Machine Works Company, Lebanon, Pa., reports a very satisfactory growth in business in 1910, as compared with the previous year. Several large contracts in connection with water works equipment, which will take practically 12 months to complete, as well as numerous orders for cinder cars and blast furnace work, are on the books, and general business has been and is expected to continue in fair volume.

The Cook Linoleum Company, Trenton, N. J., has been incorporated under the laws of New Jersey, with a capital stock of $2,000,000, and plans to erect a factory for the manufacture of linoleum, rubber and other goods. Detailed information is not available at this time.

The Philadelphia & Reading Railway, W. Hunter, chief engineer, will take bids January 17, under contract No. 49, for rails for permanent tracks between Seventeenth street and Indiana avenue and its Port Richmond branch; under contract No. 50, for special equipment in connection with it; under contract No. 53, bids for platforms and bridges over Percy street, Powers, Weightman & Rosengarten Company, and contract No. 54, coal pockets, Powers, Weightman & Rosengarten Company, will also be taken. Plans and specifications for these requirements, which are in connection with the company's new elevated road on Ninth street, may be obtained at the office of the chief engineer, 520 Reading Terminal.

While the Light Mfg. & Foundry Company, Pottstown, Pa., has plans and specifications completed for extensive modern additions to its foundry department, actual work on the improvement has been temporarily held up. In 1910 business in the aggregate showed a material increase over that of 1909, even though the demand decreased sharply toward the close of the year.

The Baltimore Siegwart Beam Company, Baltimore, Md., is having plans prepared by J. E. Laferty, in that city, for a steel and corrugated iron building to be erected in the Curtis Bay district, Baltimore, on a portion of a 6½-acre plot leased from the city, which will be equipped for the manufacture of Siegwart beams and patented concrete products. The president of the company is Daniel A. Leonard, Builders' Exchange Building, Baltimore; treasurer, Victor C. Bloede; secretary, S. A. Brooke, who together with S.

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Franklin Bennett and F. M. Barrett constitute the Board of Directors. It is expected that contracts for the new plant will be let at an early date.

Considerable work under the direction of the Department of Wharves, Docks and Ferries, city of Philadelphia, is in prospect. Already bids are being asked for the superstructure of Vine street pier. Plans for a new pier at Dock street have been completed, while tentative plans have been made for a new pier at Allegheny avenue. Both these projects will have to await an appropriation by City Councils, however, before the work can be done. A municipal dredging plant has been acquired and will, it is expected, be increased in efficiency.

The Baldwin Locomotive Works was successful last week in taking two very satisfactory orders, as well as several smaller ones for various types of locomotives. The most important contract was for 196 engines, for the Harriman lines, while one for 22 freight engines for the Pittsburgh & Shawmut Railway was also closed. These orders, deliveries on which extend through the first half of the year, will enable the Baldwin Works to maintain about the present rate of activity, which is considerably below normal, during that period, although other moderate orders in sight are expected and, if received, will increase the productive rate. Many departments of the plant are operating on single turn, and in some short time has been in force.

The Keystone Multiple Parts Company is removing its plant from 314 North Seventeenth street to 1516 South Ninth street, where materially increased facilities are available. It will install several new machine tools and expects to be in full operation at the new plant by February 1.

The Jacobs-Schupert United States Fire Box Company, Coatesville, Pa., has applied for a charter under Pennsylvania laws. Those interested are A. F. Huston, Charles L. Huston and Joseph Humpton of the Lukens Iron & Steel Company, together with a number of officials of the Atchison, Topeka & Santa Fé Railroad. The company controls the patents and has erected and equipped a plant at Coatesville for the manufacture of the Jacobs-Schupert fire boxes for locomotives, invented by Henry W. Jacobs, assistant superintendent of motive power of the Santa Fé Railroad, and Frank W. Schupert.

Cincinnati

CINCINNATI, OHIO, January 10, 1911.

Many firms have not yet finished taking inventories and an accurate statement as to last year's business, including all machinery manufacturers in this section, is not yet available. While the latter part of 1910 was somewhat disappointing to the machine tool builders, present indications are that business this spring will be excellent. Deferred action on the railroad rate question has undoubtedly had a bad effect, and no matter which way the question is settled when the final decision is made it will show the railroad interests exactly where they stand and thus put an end to all the suspense that is blamed for holding up railroad orders.

Dealers in machinery supplies experienced quite a letup in business during the holiday season and the past few days do not show much improvement.

It is stated that two or three local foundries have made contracts on castings lately that will help them out considerably. At least two of these contracts were taken away from outside foundries. No general active movement is looked for just at the moment, but in almost every line there has been an increase noted in inquiries being received.

A good sized tonnage of structural steel and other material will be required for building the Carnegie Library, Hyde Park branch, Cincinnati, bids for which will be opened January 19. C. L. Stanley, clerk of the Board of Trustees, Public Library Building, Cincinnati, will furnish all details wanted.

The Factory Power Company, Oakley, Ohio, has recently made additions to its power plant, consisting of a 600-hp. Sterling water tube boiler and a 600-kw. generator direct connected to a Ball & Wood cross compound engine.

The Cincinnati Planer Company, Oakley, Ohio, has recently shipped one of its new 10-ft. boring mills to the American Bridge Company for its Gary, Ind., plant.

The Cincinnati Milling Machine Company's Oakley plant is running on full time and with practically a full force. It recently received some nice export orders.

Fairbanks, Morse & Co., have leased the six-story building at the corner of Main and Eighth streets, Cincinnati, and will move from their present location, 137 West Fourth street, some time during January.

The annual meeting of the Eureka Foundry Company, Cincinnati, was held January 2, and the following officers were elected: President, William H. Merten; vice-president, Oscar Reimert; secretary, Emmet H. Daugherty, and treasurer, Oscar Reimert.

The Triumph Electric & Ice Machine Company, Oakley suburb, reports business on the increase. Most of its orders are coming from the general trade, but there are a considerable number of large municipal lighting plants planned for the present year.

Daniel Wright of the Henry & Wright Mfg. Company, Hartford, Conn., manufacturer of sensitive drills, was in Cincinnati last week for the purpose of investigating the city's manufacturing advantages. The company has tentative plans under way for moving its Hartford plant, and it now seems probable that if this action is taken Cincinnati will be the favored point.

Subject to a renewal of its charter, the Kenton Gas & Electric Company, Kenton, Ohio, will build a new plant that will cost about $80,000. No plans have as yet been made up.

For the purpose of mining coal the Ferndale Coal Company has been incorporated at Fairmont, W. Va., with $100,000 capital stock. The incorporators are Clyde E. Hutchinson, C. H. Jenkins, E. C. Currey, J. C. Wolfe and M. M. Abbott, all of Fairmont.

The extensive additions to the power plant of the University of Cincinnati are nearly completed. A new heating plant is also being installed.

Cleveland

CLEVELAND, OHIO, January 10, 1911.

Many manufacturers will not finish their inventories until the end of this week and until these are out of the way they are giving machine tool purchases no consideration. Two or three orders for fairly good lots of tools that had been pending for some time were placed during the week, but with these exceptions little business was done. Companies operating manufacturing plants in most cases hold their annual meetings during the first half of January, and at these meetings plans for plant extensions and the purchase of additional equipment are generally discussed and acted upon by the directors. Considerable business is now pending, inquiries being sent out in December in anticipation of action at the annual meetings authorizing the purchase.

Inquiries for electrical equipment in small and medium sized units have improved since the first of the year and the outlook for this line of equipment is quite promising. A large amount of building work is in prospect this year in this and other northern Ohio cities, which indicates an active demand for power equipment for buildings. Mining machinery is quiet. There is some inquiry for water wheels. Makers of agricultural implements in this territory generally report a record breaking year in the volume of their business during 1910, and orders for 1911 are so far very satisfactory. The inactivity of the railroads is responsible for a light demand for locomotive cranes and steam shovels, but the early spring is expected to bring an improvement in orders for this class of equipment.

The Wellman-Seaver-Morgan Company, Cleveland, reports the receipt of a number of orders recently, among them the following: A steam operated coal car dumper, with mule haulage system and sprinkling device, for the new Erie Railroad dock in Cleveland; a wheel blank manipulator for the Midvale Steel Company; an electric traveling scale car for the Columbia Chemical Company, Barberton, Ohio; a two-compartment steel head frame, 90 ft. high, with cages, skips, sheaves, &c., for Campania Minera d'Penoles, Makina, Mexico; two electric hoists with steam shell drums for Minas del Tago, Rasario, Mexico.

The Forest City Engineering Company, Cleveland, has prepared plans for a four-story brick and steel manufacturing plant to be erected at Clark avenue and West Fortieth street, Cleveland, by the Schultz-Ruck-Delfs Shoe Company. A 60-hp. gas engine will be bought and probably a generator for a lighting plant.

The Northern Ohio Power Company, Akron, Ohio, has been incorporated, with a capital stock of $10,600. This company will build the new power house to be erected near Akron for the Northern Ohio Traction & Light Company. Engineers are now working on plans for the new plant.

The Union Metal Mfg. Company, Canton, Ohio, has purchased a building site in that city along the Wheeling & Lake Erie tracks, north of the workhouse, and will shortly begin the erection of a new plant. The company makes ornamental metal lamp posts and metal columns.

The Portage Rubber Company, Akron, Ohio, will enlarge its reclaiming plant at Barberton, Ohio, by the erection of a three-story building. It is also announced that the company will erect a manufacturing plant in the spring. At a

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recent meeting of the stockholders the capital stock was increased from $10,000 to $1,000,000.

The Irwin-Boothe Cordage Company, Findlay, Ohio, has been incorporated, with a capital stock of $10,000, by James W. Irwin and others, to handle cordage, cables, tools and other equipment used in the drilling of gas and oil wells.

The Kinsey Mfg. Company, Toledo, Ohio, has completed its new plant for the manufacture of automobile parts, which was thrown open for a public inspection January 4. The main building is three stories and 105 x 286 ft. Adjoining this is an L 65 x 75 ft., four stories and basement.

New England

BOSTON, MASS., January 10, 1911.

No material change has taken place in the machinery market. Store trade is a trifle stronger, but general business has not increased. Contracts have not been placed on the several lists of tools which have been given the dealers. The latest, and one of the most important, is that of the Lamson Consolidated Store Service Company, Boston, for its shops at Lowell, Mass., which totals some $20,000 worth of machinery. The General Electric Company's plants at Lynn and Pittsfield, Mass., are running at about normal capacity. An exceptional department is the steam turbine shop at Lynn, which is very busy. Undoubtedly an immediate increase in production will be experienced at both these works, the present condition being influenced largely by the taking of inventory. Current rumor has it that a large machinery manufacturing house will replace large works located near Boston by an entirely new plant, which will require a long list of new equipment. The tool steel trade reflects the general trend of business, but the dealers in foreign steels are placing orders freely, in the belief that the spring business will be a good one.

The Vanadium Metals Company, East Braintree, Mass., will erect a foundry at Groton, Conn., 63 x 227 ft., of brick and steel. The company states that it will be in the market for machinery and other equipment later, but has reached no decision as yet. The products are Victor vanadium bronze, brass, aluminum, noncorrosive silver metal and antifriction metal.

The General Electric Company will add to its works at Pittsfield, Mass., a general storage and office building, 200 x 500 ft., and four stories. A building for the motor testing department is under construction, connecting buildings 26 and 28. The new punch and press building is completed and is now being occupied.

The directors of the Boston & Maine Railroad have appropriated $190,000 for immediate use in strengthening the bridges between Wells River and Newport, Vt., and $80,000 for a steel bridge at Bath, N. H.

The business of the Bay State Brass Company, Haydenville, Mass., manufacturer of brass fittings, will resume immediately, under the management of S. S. Cassard, who has represented creditors during the bankruptcy proceedings. The property was sold at auction last week, going as a unit to H. J. B. Willis, Nassau Bank, New York, for some of the creditors.

The Bridgeport Wire Goods Company, Bridgeport, Conn., is completing a new factory at Port Chester, consisting of a one-story building, 32 x 95 ft. The equipment has been purchased.

The M. B. Schenck Company, Meriden, Conn., has made a large increase in capital stock, and has tentative plans for extending its product.

The Steel & Johnson Mfg. Company, Waterbury, Conn., brass manufacturer, will erect a four-story building as an addition to its works, 43 x 134 ft., with elevator and stair tower. It will be of factory construction, and will connect with present buildings.

The Solderene Mfg. Company has been incorporated in Boston with authorized capital stock of $100,000, to manufacture Solderene, a combination of solder and flux. The business was formerly carried on under a different management by a company of the same name which has gone out of existence. The new corporation is distinct from the old. The factory will be located in Boston. The incorporators are Walter R. Dame, Henry R. Luther, John W. Ogden and Alfred R. Hussey. Mr. Ogden's address is Malden, Mass.

Workman & Newman, 53 Clifford street, Providence, R. I., have purchased land at Chestnut and Bassett streets, and have general plans for the erection of a new factory building.

The Archibald-Guilford Wheel Company, Guilford, Conn., manufacturer of truck and heavy wagon wheels, largely for the export trade, has been chartered in Connecticut, with capital stock of $30,000, to take over the business of the Guilford Wheel Company. While distinct from the Archibald Wheel Company, a Massachusetts corporation, the stockholders are the same. Ralph O. Wells, Hartford, Conn., is the president; Warren Motley, Nahant, Mass., secretary; C. E. Hull, Guilford, treasurer. While no increase in capital stock has been made, the company expects to work at an increased capacity.

The National Perforating Machine Company, Kansas City, Mo., has purchased the Goodman factory, 167 Hapgood street, Athol, Mass., and will remove its business there. The company will manufacture a rotary perforating machine, a cut surfacer for surfacing the back of electric plates; a type high gauge for measuring the exact hight of electro plates; a proof press; a roll and bag press for printing roll paper and bags, and an automatic feed cylinder job press. The line will be developed gradually into a complete outfit of printer machinery.

The Lamson Consolidated Store Service Company, 161 Devonshire street, Boston, has out a considerable list of machine tools for the works at Lowell, Mass., including milling machines, engine lathes, planer and a miscellaneous assortment of tools.

The Bradley Car Works, Worcester, Mass., builder of passenger and street railway cars, is building an addition to its new plant, 90 x 200 ft., which will be devoted to the bench department of the street railway work.

The United Shoe Machinery Company, Beverly, Mass., has formally taken over the business of the Bresnahan Shoe Machinery Company, Lynn, Mass. This action is in consequence of the purchase by the Beverly company of the Wonder Worker Shoe Machinery Company. The company's business will be concentrated at Beverly.

The Domestic Vacuum Cleaner Company, Worcester, Mass., has opened a factory at 28 Cherry street. The cleaner is of the portable type.

The Providence & Fall River Street Railway Company and the Newport & Providence Railway Company have effected an alliance, for the building of seven miles of new railway which will perfect a new rail route between Providence and Newport, R. I. The work will be done in the spring, if the necessary permission can be obtained from the towns interested.

A syndicate, headed by Charles F. Prichard, general manager of the Lynn Gas & Electric Company, Lynn, Mass., has plans for a large cold storage warehouse to be located in that city. It will be a brick and steel structure.

Detroit

DETROIT, MICH., January 10, 1911.

Toward the latter part of this month a lively trade seems practically certain to come out, as heavy buying will be necessitated by the projects now under way which have not hitherto reached the stage where purchases of equipment were imperative. The demand for special tools for early spring delivery will be one of the features of the midwinter trade, and in this line the manufacturers of automobile parts promise to be among the best customers of local houses. The growing use of hard, tough alloy steels and improvements made in the higher grades of tool steels have caused a variation in the demand from this source, as compared with previous seasons, and the increasing use of automatic or semi-automatic machinery for specialized work also has an important influence upon equipment details.

The foundry trade shows signs of becoming exceedingly brisk within the next few months. Makers of brass, bronze and aluminum castings are already very busy, and crucible steel foundries have been pretty well filled lately. In the heavier lines of iron and steel work the fall and early winter season closed dull, as usual, but prospects are good.

Bids on the construction and machinery equipment of the two-story addition to be made to the manufacturing plant of the Detroit Sulphite Fiber & Paper Company, Detroit, at a cost of about $250,000, will be taken in the near future, as the plans ordered prepared by Albert Danielson, Kalamazoo, Mich., are now nearly ready. Electric power and lighting will be used throughout and the layout will be thoroughly modern in every respect.

The general construction and steam heating contracts have been let by the Pontiac Motor Cycle Company for its new manufacturing plant at Pontiac, Mich.

The Central Boiler & Supply Company, Grand Rapids, Mich., is having plans prepared for an addition to its manufacturing plant.

The Marine Boiler Works, Toledo, Ohio, will add extensively to its plant and provide equipment for operating on a considerably larger scale. This is in consequence of the

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decision recently reached to build stationary boilers as well as those of the marine type.

To provide for the increase in its business and shop facilities the Detroit Gear & Machine Company has increased its capital stock from $100,000 to $150,000.

Notwithstanding the large additions recently made to the pumping equipment of the municipal water works system, it is estimated by the Water Board of Detroit that further extensions, to cost $5,000,000 are necessary in providing for both present requirements and the city's natural growth during the next few years. Authority for a bond issue to raise that sum will be asked for from the legislature, with the understanding that the money is to be expended only as needed.

The four-story factory to be erected by the Continental Motor Mfg. Company, at Muskegon, Mich., will cover an area 70 x 100 ft., and bids on its construction will probably be taken this month. The preparation of plans was intrusted to Robinson & Campau of Grand Rapids.

The Tawas Paper Company, incorporated for $150,000, has been organized at Tawas, Mich., to establish a mill for the manufacture of paper from wood pulp.

Authority has been granted by Congress to the city of Sturgis, Mich., to erect a power dam as part of the hydroelectric plant to be operated by the municipality, and the project will be pushed to completion.

A new plant will be erected in the spring at Coldwater, Mich., by the Western Reserve Condensed Milk Company. Meanwhile an old building will be remodeled and new power plant equipment, including a boiler, engine, &c., installed. The contract for the remodeling has been let to William Preston, Coldwater, Mich.

It is reported here that considerable equipment now in service will be displaced and new purchased at various communities in northern Ohio, along its lines, by the decision of the Western Ohio Railway Company, Lima, Ohio, to enter the commercial power field and sell current for lighting purposes to cities and villages. Manufacturers of electric sets and appliances are preparing to take advantage of the situation.

The Falcon Mfg. Company, Big Rapids, Mich., is arranging for the erection of a modern two-story and basement factory, about 50 x 115 ft., the plans for which were prepared under the direction of J. B. Martin of that place.

Funds for the installation of pumping machinery and a high duty water works system will be available this winter at Big Rapids, Mich., and preliminary plans and estimates are now in course of preparation.

The Industrial Works, Bay City, Mich., has a good many orders going through the shops at present and is putting on more men in the pattern making department.

C. T. Harvey, Grand Rapids, Mich., has ordered plans drawn for a three-story factory building to be erected there, which will be occupied by the Wolverine Pearl Button Company. Construction and equipment contracts will not be let for some weeks.

The Lansing Grinding Company, Lansing, Mich., has a good run of business in prospect for the coming year. Finishing crank shafts for automobiles is a feature of its work.

Work is starting on the new plant to be built in Detroit by the Puritan Machine Company, construction of which was recently contracted for.

A two-story addition, 30 x 160 ft., will be made to the pump-house of the Detroit Edison Company on Jefferson avenue, where increased capacity is needed.

The Board of Public Works at Holland, Mich., have ordered plans drawn for consideration this month, to cover the construction of a new pumping plant for the city water system. The supply is derived from wells, and these are also to be increased in number.

Bids are now being taken at Durand, Mich., on pumping machinery for the municipality.

The Severence Tank & Silo Company, Lansing, Mich., is erecting an addition to its plant, 20 x 70 ft.

The Briggs Mfg. Company, Detroit, Mich., maker of automobile bodies, trimmings and accessories, is having plans prepared for an addition to its factory, 90 x 500 ft., three stories, to be of brick and mill construction.

The Ignition Starter Company, Grand Rapids, Mich., has been incorporated with $50,000 capital stock. The company will manufacture an ignition self-starter for automobiles and motorboats, and is having plans prepared for a factory building to be erected during the coming summer.

The Atlas Mfg. Company, Big Rapids, Mich., manufacturer of farm implements, expects to move its plant to Eaton Rapids, Mich., in the near future, and about the first of February will be in the market for a 36-in. lathe and a set of rolls for rolling roller drums.

The Korf Mfg. Company, Lansing, Mich., has been reorganized and will build a new two-story factory building. Besides the many articles now manufactured, the company contemplates making a number of implements for truck gardening purposes.

The Bates Tractor Company, Lansing, Mich., has been incorporated, with $200,000 capital stock, of which $125,000 is paid in. The company will manufacture a 20-hp. engine designed for use on farms. The erection of a plant will be commenced as soon as possible.

The Bridge Mfg. Company, Detroit, Mich., has awarded contracts for the construction of a three-story factory building, 220 x 255 ft.

The Lake Superior & Ishpeming Railroad is planning the erection of a new ore dock in Presque Isle Harbor, Marquette, Mich. It will be located a short distance from the present dock and parallel to it.

The Cadillac Electric Mfg. Company, organized with $20,000 capital stock, has been incorporated at Cadillac, Mich.

The Crescent Fixture Company, Grandville, Mich., whose plant burned some weeks ago, is arranging to rebuild on a larger scale.

Spier, Rohns & Gehrke, Detroit, will superintend the construction of a new boiler house, 48 x 80 ft., two stories, for the Stroh Brewing Company of this city.

The Rapid Motor Company, Pontiac, Mich., is adding largely to the force of men employed in its works, including machinists and tool makers, assemblers, &c., with a view to heavy production during the next few months.

The Russel Wheel & Foundry Company, Detroit, has the structural contract for the new foundry of the Buhl Malleable Company.

The Detroit Cedar & Lumber Company has decided upon the erection of a new timber cutting plant at Dollarville, Mich., in addition to one recently acquired there. Shingle-making machinery now in operation at another point is also to be removed there and provision for an enlarged output made.

The Gendron Wheel Company has had plans prepared by Langdon & Hohly, Toledo, for a new six-story building, to be used principally for storage purposes.

Mitts & Merrill, Saginaw, Mich., are making a specialty of machinery for cutting up the refuse from saw mills, so that it may be utilized in pulp mills, turpentine, chemical or other by-products plants. For all of these purposes there is a steadily growing demand.

The building contracts for the one-story manufacturing plant, 90 x 220 ft., to be erected in Detroit by the Bower Roller Bearing Company, have been let by Albert Kahn, whose office is in the Trussed Concrete Building, this city.

Kayser & Schmidt, 407 Wilkins street, Detroit, are arranging for the construction of a new power plant, 35 x 60 ft.

The Michigan Pressed Steel Company, Detroit, is adding to its force of men for sheet metal work, including die-makers.

The Bauer Metal Body Company, Detroit, Mich., has filed articles of incorporation to take over the business of the Bauer Steel Body Company, with an increase in capital stock from $20,000 to $130,000. The company is looking for a site on which to erect a factory to furnish additional manufacturing facilities. M. C. Bauer, the founder of the business, has retired from active connection with it, although he still retains an interest.

The Marshall Furnace Company, Marshall, Mich., states that the fire at its plant was confined to a small foundry building which it operated under lease through the busy season and that its loss does not exceed more than $300 or $400, as it was successful in saving most of its patterns. Operations were commenced in another foundry immediately.

Milwaukee

MILWAUKEE, WIS., January 9, 1911.

The chief interest of the machinery market at present centers in plants now under construction or recently completed, equipment for which has been mainly purchased but will be supplemented by additional apparatus to be installed in the spring or as soon as their owners feel warranted in making the necessary expenditures. All buying during the fall was, in these cases, done on the basis of minimum requirements; hence nearly every item printed in this report for some time past, with many that are still to be mentioned, constitutes a clue to much prospective business.

One of the most notable power plant improvements for industrial establishments is that of the Thomas B. Jeffrey Company, Kenosha, Wis., the equipment of which was furnished mainly by Milwaukee manufacturers. It includes new boilers with automatic stokers, engine-driven electrical

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units more than doubling the previous capacity, and many additional motors for operating machinery in the shops, which comprise five new buildings. A thoroughly modern coal handling plant has been installed.

The new shop of the Northern Machine Company at Thirtieth street and North avenue, Milwaukee, which is 60 x 125 ft., will be completed early this year, giving it much needed additional facilities.

The gas engine perfected by P. J. Holm, Eau Claire, Wis., will be built in future by the Western Machine Company, incorporated in December. Operations are now being carried on in leased quarters, but a manufacturing plant is to be constructed before summer.

The Thilmany Pulp & Paper Company, Kaukauna, Wis., will soon begin the erection of a mill, electrically operated, of the most modern type. The cost of building and equipment is estimated at $250,000.

The Webber Mfg. Company, West Allis, Wis., will erect a building on the Chicago and Northwestern Railway tracks between that city and Milwaukee and install planing mill machinery. No work is, however, to be done until spring.

The Advancement Association of Ashland, Wis., is endeavoring to have the new plant of the Kurz-Downey Company, now of Bayfield, Wis., erected in that city. This will replace one destroyed by fire in November. Better facilities for securing material and shipping the finished product are urged in behalf of Ashland.

Much interest has been aroused here in the projected high-pressure fire service system for the city of Boston, Mass., as the pumps, engines and heavy electrical motors for the majority of the systems now in successful operation in the cities of this country, together with the control apparatus, were furnished by Wisconsin manufacturers, who have made a special study of the problems involved.

The Superior Box Company, Superior, Wis., is completing a modern factory at South Superior, which later on will be increased in capacity.

Unless suitable arrangements are made for acquiring the plant of the Kaukauna Gas Electric Light & Power Company, Kaukauna, Wis., the municipality will build its own station, authority to issue bonds for the purpose having been granted at a special election. In either event, considerable machinery will need to be purchased, as the present plant is far inadequate to the requirements of the service.

The Sheboygan Fruit Box Company, Sheboygan, Wis., which has just completed a three-story addition, 50 x 98 ft., will provide some time this year for a further increase in capacity, having materially enlarged its working capital. Wood-working machinery and electric motors will be among future requirements.

The authorities at Walworth, Wis., have sold $18,000 in bonds to cover the cost of projected water works improvements.

Machinery for a planing mill will be installed before spring by the Boyd Lumber & Improvement Company, Boyd, Wis.

The Appleton Chair Company, Appleton, Wis., is ordering machinery to take the place of the equipment recently rendered useless by a fire in its old plant. The new factory just completed will be put in operation as soon as the necessary tools can be installed.

The Orlo Power & Light Company, Manitowoc, Wis., has been incorporated, and will build a hydroelectric plant. L. O. Larson and Anton O. Anderson are the principal incorporators. The development will be one of moderate size.

Most of the right of way has been secured for the Milwaukee-Western Electric Railway, whose headquarters are in Milwaukee, and construction work will begin in the spring. This enterprise has good financial backing.

Sir Robert Hart of Sydney, Australia, recently spent some time at the Berlin Machine Works, Beloit, Wis., where an order was placed for considerable wood-working machinery to be installed in one of his plants in the antipodes.

The plans of the equipment of the large new mills to be built at Menasha, Wis., by the Lakeside Paper Company, have not yet been worked out. A large quantity of machinery, including electric power units, motors, shafting, &c., will, however, be required. For the principal contracts there promises to be spirited competition on the part of the leading manufacturers represented here.

The Wisconsin Bridge & Iron Company, Milwaukee, is putting up the steel work for the new plant at Detroit to house six large pumping engines for the municipal water works system, with boilers and auxiliary equipment. Three units, with a capacity of 90,000,000 gal. daily, will be installed as soon as the station is finished.

The new box factory of W. H. Rieckhoff & Co., Superior, Wis., has been erected, and the equipment is now being completed. Some additional machinery will be provided during the year.

The plant at Appleton, Wis., heretofore operated by Herman Bach, will be taken over by the Imperial Knitting Company, of which he is the leading incorporator, and enlarged. New machinery is to be provided.

The H. A. Stocker Machinery Company, Chicago, through its Milwaukee office, has closed a contract for the machine shop equipment of the Independent Electric Company of that city.

Toronto

TORONTO, January 9, 1911.

The demand is much less equable than it was. Instead of being uniformly good for almost every variety of plant, it is variable, being active for some classes of machinery and in various degrees of dullness in others. Orders for factory equipment reflect this unevenness, the inference being that in some lines of manufacturing the starting up of new businesses and the extending out of old have not been going on as before, but in other lines of manufacture the capacity gives every indication of further expansion. In fact, this seems to be the rule in the manufacturing business generally. Makers of agricultural implements appear to calculate upon a good year's trade, for they are running their works to the full limit. There are several contracts for large installments being worked upon by makers of plant, and others of importance are being figured on. These relate to power plants, pulp and paper mills, mine machinery, &c. It is stated that there will be a considerable quantity of mining machinery brought from England to the Porcupine gold district in northern Ontario.

North Vancouver, B. C., is installing a municipal telephone system. A 25-hp. motor generator is part of the system. Exclusive of building, the plant is to cost $15,000.

The City Council of Edmonton, Alberta, has provisionally passed debenture bylaws to raise and expend $456,000 on public works. These include $167,000 for a bridge over the Saskatchewan River.

The Montreal Stock Exchange has received notice from the directors of the Montreal Steel Works, Ltd., that they have agreed to sell their stock to a syndicate on the following terms: Preferred shares at 137½ and common shares at 162½, and dividend now declared of 1¾ per cent. on the preferred and 7 per cent. on the common. The sale is made subject to the assent of 55 per cent. of the shareholders, and payment is to be made before March 25. It is stated that the syndicate desires to hand over control to Canadian car interests. The Montreal Steel Works, Ltd., manufactures steel castings, springs, railroad supplies, forgings and track tools.

The Canada Keg & Barrel Company has changed its plans for locating in St. Catharines, Ont., and has decided to go to Orillia, Ont., instead. In the latter town it has secured a five-acre site next to the new silver smelting works. It will manufacture the Sanford patent package.

Canada Motors, Ltd., incorporated recently with a capital stock of $250,000, is arranging to build a plant in Galt, Ont., where at the outset it will confine its operations to the making of two passenger road cars. George Dabie is president of the company.

Speaking at a banquet given to the employees of the Canadian Brass Company, Galt, Ont., on December 29, 1910, Harry Leddin, the superintendent, said that three years ago five or six prominent manufacturing concerns in the United States had the first-class brass trade of Canada, but that this trade has now passed into the hands of Canadian manufacturers, who turn out an equally good article.

It is stated by the *Advertiser* of London, Ont., that a company is about to begin the manufacture of automobiles in that city.

The Western Clays, Ltd., is the name of a company that is preparing to manufacture brick on a large scale at Edmonton, Alberta. By the beginning of spring its plant will be ready to turn out 40,000 brick per day. The brickmaking outfit for the company has been shipped from England, and is now on the way.

In order to encourage the copper industry the Dominion Government has passed an order in Council providing that no royalty shall be charged on products of copper mining for 10 years, that is, up to the beginning of 1921. Of course, this relates only to copper produced from mines under Dominion jurisdiction and has no application to the output of mines under the jurisdiction of a province that owns the Crown lands within its bounds.

The Galt Foundry Company, which is building a foundry at Galt, Ont., expects to be turning out castings by the middle of January.

The Kemp Mfg. Company of Toronto, will henceforth be known as the Sheet Metal Products Company of Canada.

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The headquarters will be as at present, the big works on Gerrard street, Toronto. With these works will be included in the new concern the works of the Macdonald Mfg. Company, Toronto, those of the Kemp Mfg. Company in Winnipeg, and those of the Kemp Mfg. Company in Montreal.

The City Council of Regina, Saskatchewan, has decided to place an order for a number of cars for the city street railroad. The Ottawa Car Company is expected to build the cars.

British manufacturers and exporters are showing more interest in Canadian trade, and in many cases are seeking to obtain connections through the appointment of Canadian agents. Canada's High Commissioner in London reports many inquiries there for the names of agents, high class firms, &c., in Canada through whom could be sold electrical switch gear, hydraulic and electric lifts, cranes and winches, hydraulic and sanitary plant, air compressors, steam engines, oil and gas engines, street railroad equipment, trucks, machine tools, mill furnishings, gas producers, marine engines, boilers, motors, motor craft, &c.

The Dryden Timber & Power Company, Dryden, Ont., contemplates the erection and equipment of a paper mill at that place to cost approximately $1,000,000. Plans are being prepared. J. E. Fellows is president of the company.

The Steel & Radiator Company of Toronto, has secured a manufacturing site of 35 acres at St. Catherines, Ont., and will build a plant for the manufacture of boilers and radiators.

A flour mill having a capacity of 3000 barrels per day and an elevator having a capacity of 1,000,000 bushels, is to be erected at Toronto, Ont., by the Imperial Flour Mill Company on the site of the Alexander Brown Milling Company on the Esplanade.

The Canadian General Electric Company will construct a power house on the water works dam near Peterborough, Ont. Bids are now being received.

The engine room, boiler house and machine shop at the Bartlett Mine, Gowganda, Ont., were burnt down some nights ago and their contents destroyed. The engines, compressor, &c., destroyed cost $30,000.

The International Contracting Company, with headquarters at Winnipeg, has been incorporated by Dominion authority, with an authorized capital stock of $50,000,000.

The by-law to raise money for the installation of a municipal power and lighting plant in Dundas, Ont., was carried by the ratepayers January 2. The ratepayers of Chatham, Ont., voted to grant the Western Bridge & Equipment Company a site for an enlarged factory. Fergus, Ont., ratepayers voted to loan $25,000 to an industry, to invest $20,000 in the preferred stock of the projected People's Railway and to grant the company a franchise. The ratepayers of St. Catharines, Ont., approved a by-law to expend $180,000 on waterworks extensions and new equipments. Toronto ratepayers approved by-laws providing for a total expenditure exceeding $2,000,000 on specified works, half of this sum being for the construction of new street railway lines.

The Collier Electric Company, manufacturing electric heaters, arms, and other articles is removing its works from Peterborough, Ont., to Uxbridge.

R. L. Johnston is promoting a company to establish and operate rolling mills at Sydney, N. S.

The Canadian Electric Automatic Machines, Ltd., Ottawa, Ont., recently incorporated with $225,000 capital stock, advises that it is undecided whether it will take up an existing plant or erect a new one. The matter is now under consideration.

Indianapolis

INDIANAPOLIS, IND., January 10, 1911.

The G. & J. Tire Company will erect a one-story brick addition to its plant at Indianapolis, with basement and subbasement, to be used for press work. It will also build a fourth story to the main building for the manufacture of tires. Steel construction will be used in both improvements, which are to be fireproof. The cost will be $50,000.

The John Dierdorf Piano Company has been incorporated at Indianapolis, to manufacture pianos. The capital stock is $50,000. The directors are John Dierdorf, Fred Dierdorf and C. E. Haworth.

The Vincennes Bridge Company, Vincennes, Ind., has secured the contract for the construction of a bridge over the White River, near Edwardsport, Ind. The contract price is $16,548.

Frank M. McKey of Chicago, Ill., receiver for the Black Mfg. Company, Chicago, has been appointed ancillary receiver in Indiana in order to have jurisdiction over $24,000 of automobiles and parts at Elkhart, Ind., in possession of the Crowe Motor Car Company.

Representatives of the engineering department of Purdue University have tested the electric light plant at Portland, Ind., with a view to reporting as to improvements necessary.

By order of the court, receiver T. J. De la Hunt will sell the plant of the Rider-Lewis Motor Car Company, at Anderson, Ind., at private sale on or before February 1.

The two plants of the Western Motor Works, at Marion and Logansport, Ind., will be consolidated at the former city, with the exception of the foundry, which will remain at Logansport. The company makes the Ruetenber motor and employs 500 to 600 men.

Contracts have been let for the structural steel for the plant of Orton & Steinbrenner at Huntington, Ind., which will manufacture locomotive cranes. The company was brought from Chicago, citizens of Huntington taking $40,000 of preferred stock.

The capacity of the cement mill at Speeds, Ind., belonging to the Louisville Cement Company of Louisville, Ky., is being doubled in capacity, to an output of 4000 barrels daily.

The central power plant of the Gas City Water & Electric Light Works, Gas City, Ind., was burned January 6, with $40,000 loss. It is a municipal plant.

A Commercial Club has been organized at Daleville, Ind., with the object of inducing factories to locate there. The president is Frank J. McAllister; the secretary, Wilbur Polhemus.

The Motsinger Device Mfg. Company, Pendleton, Ind., manufacturer of devices for automobiles, will move its plant to Lafayette, Ind.

The City Council of Logansport, Ind., is considering the installation of an additional pump at the water works.

A new boiler room is being constructed at the roundhouse of the Baltimore & Ohio-Southwestern Railroad, Seymour, Ind., in which will be installed a new boiler and engine.

The South

NASHVILLE, TENN., January 9, 1911.

Municipal contracts are again becoming the most prominent feature of trade, and a large quantity of equipment of various kinds will be involved by contracts soon to be awarded. Manchester, Tenn., will enter upon the construction of a pumping plant and modern water works system as soon as permission for a bond issue is granted by the state legislature. The city of Crowley, La., is preparing to increase the capacity of its power plant, which now includes two engine-driven electric generators of 300 kw. Purchase of a 150 kw. unit and one of 75 kw. has been authorized. The city of Fayetteville, N. C., has awarded contracts for the construction and mechanical equipment of a filtration plant of 1,000,000 gal. daily capacity. A new pump is to be bought for the municipal water works at Napoleonville, La., and extensive remodeling of the system entered upon. Engineers have been engaged by the authorities at Smithfield, N. C., to plan an electric light plant and sewage system, with a pumping plant auxiliary to the present water works, and at Rome, Ga., a bond issue of $75,000 has been voted for the improvement of the pumping station and water distribution system. Other work is mentioned below.

Arrangements will soon be completed by the Jacksonville Electric Company, Jacksonville, Fla., for the erection of the large new generating station to replace its present plant.

It is reported from Norfolk, Va., that the site of the plant formerly occupied by the Standard Box & Lumber Company, which burned, will be utilized for a new factory to be erected by the James Lumber Company of Durham, N. C. Direct confirmation of this has not been given.

Ladshaw & Ladshaw, Spartanburg, S. C., are completing plans for the large hydro-electric plant to be constructed by the Nolachucky Power Company on the Nolachucky River at Erwin, Tenn.

The municipal power plant at Gartersville, Ga., which is equipped with a Stanley G. E. generater of 200 kw., driven from an engine built by the Harrisburg Foundry & Machine Company, Harrisburg, Pa., will be enlarged in capacity, with the object of supplying current for commercial day load.

It is reported from Jackson, Miss., that a large factory site has been acquired in the new industrial suburb of that city, known as Duttoville, upon which to erect a branch manufacturing plant for the Trexler Lumber Company, Allentown, Pa.

The City Council of Charleston, S. C., has ordered pre-

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liminary plans and estimates prepared for a new electric power and pumping plant to serve the municipality.

J. Newton Johnson, city engineer of Florence, S. C., has been engaged by the municipal authorities at Kingstree, S. C., to estimate the cost and outline a plan for water works there.

The Porter-Wadley Company, Cotton Valley, La., is proceeding with plans for a new plant to replace the saw mill destroyed by fire several weeks ago.

Bids are to be closed January 18 by the United States Engineer at Vicksburg, Miss., for a steel-hull, self-contained hydraulic dredge, steel pontoons, pipe line, &c., to be used in river service. The specifications include very complete equipment.

An extension of the power system of the Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., is contemplated.

It appears to be definitely settled that additional generating units will be provided by the present owners for the plant of the Citizens Light, Heat & Power Company, Montgomery, Ala., raising its capacity from about 1000 kw. to 7500 kw. Steam turbines have been selected as the prime movers to be used, and there will be a large line of auxiliary equipment.

It is reported from Ocala, Fla., that the Sumner Lumber Company of that place will build a new timber cutting plant at Zuber to replace one recently burned.

New bids are to be taken at Norfolk, Va., for the pumping machinery heretofore mentioned, as those submitted are said not to have complied fully with the specifications. Information can be obtained by addressing the city engineer.

The Ross-Meechan Foundry Company, Chattanooga, Tenn., which recently suffered from fire, is taking steps to repair the damage.

An electric power plant is to be erected for the Sayre Mining & Mfg. Company, Sayre, Ala., and other improvements of an extensive character made this year.

The Rowland Lumber Company, Bowdens, N. C., has provided for doubling the capacity of its plant, giving it two band mills and resawing machinery, with very complete auxiliary equipment.

Manchester, Tenn., contemplates issuing $25,000 worth of bonds for construction of water works and electric light plant.

The Greenville Mantle & Mfg. Company, Greenville, S. C., has been incorporated to take over the business of the Cochrane Mantle & Novelty Company, Charlotte, S. C. The company will move its machinery and working force to its new building at Greenville, now in course of erection, and expects to be in full operation by March 15. The president of the new company is Albert Barnes; vice-president and treasurer, T. Q. Donalson; secretary, H. T. Sturtevant.

The Laurel Compress Company's plant, Laurel, Miss., was destroyed by fire December 17, causing a loss of about $25,000.

The plant of the Alabama Marble Company, Sylacango, Ala., was destroyed by fire December 10. The loss of the company is estimated at $500,000. John S. Sewell is the manager of the company.

The Great Southern Automobile Company, Birmingham, Ala., has increased its capital stock from $100,000 to $500,000, to provide for improvements in its factory equipment and to install a brass and iron foundry.

The Atlanta Utility Works, East Point, Ga., manufacturer of cotton oil and fertilizer machinery, is in the market for one 5, three 10 and one 20 hp. power induction 220-volt 60-cycle motors. Information as to condition, location, make, speed and price are desired. Address W. W. Rushton, secretary and treasurer.

St. Louis

ST. LOUIS, MO., January 9, 1911.

Considerable in the way of prospective business has appeared during the past week and machinery merchants feel that the outlook for 1911 promises well. There has been little in the way of actual orders since our last report. Some buyers from Nebraska were in town and bought a few light tools and a good inquiry has appeared from a new bridge shop starting in Omaha. Second hand machinery has been moving rather slowly and is not expected to show a good demand much before spring.

The acquisition by the Burlington Railroad of a solid block on North Second street is in line with the policy of the railroads to remove their freight house facilities from East St. Louis to the St. Louis side. The Missouri, Kansas & Texas is making rapid progress with its great freight house on North Broadway, the Cotton Belt has its new similar proposition well advanced, and the Rock Island is also spending much money on terminal facilities in the same neighborhood. The Pennsylvania Railroad has given notice of its intention to move its freight house to the west side.

The Light, Power, Ice & Storage Company, Lee's Summit, Mo., has been incorporated. The capital stock is $20,000. The incorporators are Charles M. Hanks, L. G. Morris, John H. Cook and others.

The reorganization of the St. Louis Car Company is making satisfactory progress, and John I. Beggs is reputed to contemplate increasing his investment from $350,000 to $750,000.

J. R. Johnson is erecting a stave mill at Delight, Ark. The mill, which is a large one, is located on Wolf Creek. He expects to have the plant in operation within 30 days.

J. A. Snyder, Third and Louisiana streets, Little Rock, Ark., is promoting a factory for the manufacture of cement tile.

The municipal authorities at Hopkins, Mo., have under consideration the construction of a modern, high-duty pumping plant and water distribution system.

It is reported from Hamburg, Ark., that the plant of the Missouri & Arkansas Lumber Company, which burned some time ago, will be rebuilt along the most modern lines. The company is to be in the market for power and operating machinery.

Interests identified with the Continental Power & Development Company, Sedalia, Mo., have acquired the site for a hydroelectric plant on the Niangua River, and will develop it for the purpose of furnishing current to Warsaw and vicinity for industrial power and lighting service.

Texas

AUSTIN, TEXAS, January 7, 1911.

It is anticipated that there will be a considerable increase in the demand for machinery in Texas, the Southwest and Mexico with the development of enterprises that are now being planned for the early part of the new year. There has been recently a noticeable increase in manufacturing projects in Texas, and while most of the new plants are of small size they are taken to be an indication of the dawning of a new era in this industrial line.

A shuttle block factory will be established at Nacogdoches, Texas, by L. C. Russell of Chicago and associates.

O. L. Williams of Dallas, representing a New York syndicate, is arranging to erect a meat-packing plant at Pecos, Texas.

Dr. E. S. Link of Crystal City, Texas, will build a furniture factory at that place. Mesquite timber will be used for the manufacture of high grade furniture. He will also install an electric power plant which will furnish power for operating the furniture factory and irrigation pumping plants in that section. A saw mill is to be operated in connection with the furniture factory.

Another gas main will be laid from the Petrolia gas field in Clay county to Wichita Falls by the North Texas Gas Company.

The South Houston Iron Works, South Houston, Texas, will be finished the early part of the year. C. H. Ruggles is interested.

The Foote-Rolaff Machine Company, San Antonio, was recently incorporated with a capital stock of $10,000. The incorporators are W. G. E. Rolaff, George W. Foote and B. V. Samuell.

The new iron foundry of William Willig at San Angelo, Texas, was finished and placed in operation December 23.

Carter Smith of Tucumcari, N. M., and Fullwood Brothers, of Bard City, N. M., are erecting a broom factory at the former town. It will have a daily capacity of 40 dozen brooms.

J. D. Anderson of Amarillo, Texas, contemplates erecting a planing mill at Tucumcari, N. M.

The Flagstaff Lumber Mfg. Company will erect a planing mill and large box factory at Flagstaff, Ariz. The company recently completed the installation of a lumber mill of 100,000 ft. daily capacity at that place. It is also constructing a logging road from Flagstaff into a virgin tract of timber.

The Crystal Ice Company, Fort Worth, was recently incorporated with a capital stock of $40,000. The incorporators are E. P. Meddox, H. L. Calhoun and George A. Calhoun, all of Fort Worth.

Natural gas will be piped into Mexico from the Reiser field, situated 28 miles from Laredo, Texas. The Mexican Government has granted a concession to Jose Maria Ramos and Erasmo Martinez of Nuevo Laredo, Mexico, to lay pipe lines for gas and construct distributing systems in the state of Tamaulipas. This concession is said to be part of a plan to erect a smelter at Nuevo Laredo. The project of

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piping the gas to Monterey, in the state of Nuevo Leon, 150 miles south of Laredo, is also under consideration.

James Lewisholn of the city of Mexico, representing a syndicate of Americans, has been investigating the situation at Tampico, Mexico, with the view of establishing a large canning plant. It is stated that it is purposed to invest about $50,000 in the enterprise.

The plant of the Taylor Water Company, Taylor, Texas, has been purchased by Andrew J. Zilker of Austin, Texas. The new owners take charge January 1, and will immediately inaugurate a programme of extensive improvements.

Lon C. Hill of Harlingen, Texas, has played orders for the new sugar refinery which is to be erected on the Hill plantation, and work will soon be started. The cost of the refinery will be $600,000. Fifteen miles of standard gauge railroad, with equipment, will also be contracted for.

One of the roundhouses of the Texas Central Railroad Company at Walnut Springs, Texas, together with five locomotives, was destroyed by fire December 19, causing a loss exceeding $50,000.

The construction of a system of water works at Rusk, Texas, which was provided for by the recent issue of $18,000 of bonds, will soon be started.

The proposition of erecting a municipal electric light and power plant at Waco, Texas, is still under consideration by the municipal authorities. It is planned to issue $250,000 of bonds for the purpose.

The Uvalde & Leon Valley Interurban Railroad Company, which now operates a gasoline motor car line between Uvalde, Texas, and Sansom, contemplates extending the road to Batesville, a distance of about 25 miles. If the proposed extension is made it is probable that the line will be operated by electric power. This would necessitate the erection of an electric power station.

Citizens of Fort Worth, Texas, have inaugurated a movement to have the city issue $2,000,000 of bonds, the proceeds of which shall be used for the construction of extensive additions and improvements to the water works plant and other public works. The proposition is meeting with general favor, it is stated, and the bonds will probably be issued as soon as the necessary preliminary arrangements can be made.

To provide an ample supply of water for the city of El Paso, Texas, the City Council has taken steps toward the installation of an additional pump which will have a daily capacity of 4,000,000 gal.

G. W. Smith of Cleveland, Ohio, has purchased from Ed. C. Lasater of Falfurrias, Texas, the water works plant, electric power plant and lighting system and ice factory at the latter town. He will make important improvements and additions.

The City Council of Wichita Falls, Texas, has granted J. W. Culbertson of that place franchise for a natural gas distributing system, which will cover all the business and most of the residence streets. He will pipe the gas to Wichita Falls from the Clay County gas field, a distance of about 15 miles.

The Texas City Light, Sewerage & Water Company, which was recently organized for the purpose of installing an electric light plant, sewer system and water works at Texas City, Texas, has begun work on the sewer system.

The cold storage facilities of the Northern Produce Company at Guero, Texas, will be doubled. It will also install a 30-ton ice plant.

The Austin Street Railway Company, which was recently reorganized with a capital stock of $1,250,000, will make important improvements and extensions to its property at Austin, Texas. The new incorporators are: R. C. Story of Boston, Mass., William G. Bell and W. H. Folts of Austin.

The Crystal Ice Company, Weatherford, Texas, has obtained authority from the secretary of state of Texas to manufacture gas, electric light and power.

The Weimer Water, Light, Ice & Cold Storage Company, recently organized, has taken over the electric light plant at Weimer, Texas, and will enlarge and improve it by installing additional machinery. The company will also install a water works plant, ice factory and cold storage plant. William Hillje is president of the company.

The Hope Community Irrigation Company will construct a large system of irrigation and install pumping machinery upon its land near Hope, Eddy county, New Mexico. About 20,000 acres of land will be reclaimed. W. P. Riley, W. J. Lewis, H. M. Gage and C. M. Botts are interested in the project.

Arrangements are being made by a French syndicate, represented by E. Brunel, French consular representative at Irapuato, Mexico, for the construction of an extensive system of interurban electric railways in the state of Guanajuato.

The Southwest

KANSAS CITY, MO., January 9, 1911.

In making their estimates of business for the year that is before us, the leading manufacturers and distributers of the Southwest appear to be a unit in the expectation of liberal orders from all parts of the territory covered by their salesmen. For the past fortnight there has been the usual slowing down in trade, but, now that the holidays are over, it will undoubtedly come back in increased measure.

It is reported from Coffeyville, Kan., that the business interests of that city are endeavoring to secure the location there of the plant of the Eli Bridge Company, an Illinois corporation.

A battery of boilers, high duty pumping engine of 1,000,000 gal. daily capacity and a centrifugal pumping unit are included in the plans for water works improvements at Tulsa, Okla.

Much additional equipment is being installed at Clarksville, Ark., by the Arkansas Anthracite Coal & Land Company, Fremont Stokes, manager, giving it greatly enlarged capacity.

The Sherman Iron Works, Oklahoma City, Okla., has been awarded the contract for a sewage plant and system at Yukon, Okla.

A steam turbine power plant is now being installed at Wichita, Kan., by the Kansas Gas & Electric Company.

The Copper Queen Mining Company, Douglas, Ariz., is preparing for the installation of two turbo-generator sets to supply current for operating motor driven machinery.

T. S. Gill and others of Tishomingo, Okla., have organized the Tishomingo Native Granite Company and will install quarrying and handling machinery. Only moderate capacity is to be provided for at the offset, with an increase in equipment later.

Preliminary arrangements for the installation of a pumping plant and water works system are being made at Ralston, Okla.

It is proposed at Newton, Kan., to provide a steam-engine-driven electric unit of 150 kw., motor-driven well pumps and a pumping engine for water distribution in the municipal service plant at Newton, Kan., where a bond issue of $50,000 for improvements has been authorized.

The Las Cruces Electric Light & Ice Company, Las Cruces, N. M., which is operating an engine-driven generating plant of about 125 kw., has arranged to extend its distribution system.

The Caddo Power Company has been organized at Caddo, Okla., to operate a public service plant.

A bond issue to cover the cost of a municipal pumping system is proposed at Elk City, Kan., where definite action in the matter will probably be taken before spring.

Interests identified with the Kansas City Pump Company, Kansas City, are planning the construction of a plant of considerable size for the manufacture of gasoline engines, ground for which has been acquired.

The Twin Peaks Mining Company, Clifton, Ariz., is planning the construction of a power plant at York station, from which electric current will be transmitted to operate its mining and concentrating machinery.

Two hydraulic rams with a capacity of 12,000,000 gal. daily, are included in the plans for water works extensions at Ada, Okla.

The Missouri Pacific Railway Company is reported to be planning the construction of extensive car building and repair shops at Lexa, Ark., to replace those now operated at Wynne, Ark. Official announcement of this has not, however, been made.

The proposed extension of the water works at Arkansas City, Kan., will not be carried into effect at this time, a bond issue for the purpose having been defeated.

Bids will be opened January 19 by the city of Douglas, Ariz., for the construction and equipment of a water works system. E. P. Archer & Co., Kansas City, are consulting engineers, and specifications may be obtained from them. The machinery required includes two crude oil engines of 110 hp. each, two power pumps of 750 gal. per min. capacity each, two belted air compressors, each delivering 200 cu. ft. of free air per min. at 50 lb. pressure, a five-tone hand crane for the engine room, valves, hydrants, &c.

Extensive plans for the equipment of its property, including the erection of a large ore reduction plant and hydro-electric power station, are reported to have been made by the Climax Mining Company, Prescott, Ariz., where a 10-stamp crushing mill was recently installed.

An oil storage system and steam hoist are being installed by the Mogollon Gold & Copper Company, Mogollon, N. M., and a machine shop for repair work will be built.

W. D. McBee, Clovis, N. M., is organizing a company to install an electric power plant and furnish current for

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motor-driven centrifugal pumps used in irrigation service, the water being taken from wells.

The Tulsa Boiler & Mfg. Company, Tulsa, Okla., has been awarded the contract for the new bridges to be constructed in the county.

It is proposed at Francis, Okla., to issue bonds for water works.

The Mangum Electric Company, incorporated for $20,000, has been organized at Mangum, Okla., to install and operate a public service plant.

Shelbina, Mo., is having plans prepared by Rollins & Westover, Kansas City, Mo., for the construction of a water works system at an estimated cost of $40,000.

Bids will be received until January 26 by Kansas City, Mo., for the construction, delivering and erection of a horizontal shaft centrifugal pump direct connected to vertical cross compound engine of capacity to deliver 30,000,000 gal. of water to an elevation of 50 ft.

Moberly, Mo., is contemplating the construction of an electric light plant. L. G. Knapp & Co., Kansas City, are the engineers in charge.

It is reported that the Utah Light & Railway Company, Ogden, Utah, will enlarge its plant early in the spring.

The city council of Guthrie, Okla., is preparing to expend $10,000 for extension of water mains.

The Muskogee Mfg. Company, Muskogee, Okla., is erecting a new plant and advises that it will need some new machines and general equipment for a wood working department. Included among the machines to be installed are a spoke and handle machine besides machines for general planing and mill work. The company will also install a complete dry kiln for which it will purchase the entire equipment.

The Oklahoma Railway Company, Oklahoma City, Okla., has plans under consideration calling for an expenditure of about $200,000 for improvements to its electric light plant. The company contemplates interurban lines to Guthrie and El Reno.

A bill is to be introduced in the Kansas Legislature, which calls for the establishment of a State broom factory, to be installed either at the Lansing prison or the Hutchinson reformatory or both, much like the twine factory already in operation at Lansing, Kan.

The planing mill of J. E. Jones, McAlester, Okla., was destroyed by fire December 28, causing a loss of $10,000 to $15,000.

The Northwest

ST. PAUL, MINN., January 9, 1911.

Traveling men who were home for the holidays brought reports of a great deal of activity impending among the local industries of the sections regularly visited by them and left considerable future material for this report in the shape of construction items which can be published as soon as confirmed. It is evident that the States of Montana and Idaho will be the scene of greater activity, from an industrial standpoint, than has been known for at least some years, and the sections farther east are not likely to be any more backward.

George R. Griffith, Pipestone, Minn., will install an electric power plant, for lighting and industrial service, at Minneota, Minn., early in March. Equipment details are now being considered.

The Crown Iron Works, Minneapolis, has the contract for the structural work of the new public building to be erected in Aurora, Minn.

The authorities at Musselshell, Mont., are planning a modern system of water works.

It is stated that Consulting Engineer D. H. Maury recommends to the city of St. Paul the drilling of additional wells and the installation of motor-driven centrifugal pumps.

The installation of additional boilers, a centrifugal pumping unit and high pressure pump are recommended for the sewage plant at Minneapolis.

The woodworking plant of the Hardwood Door Company in St. Paul, which was destroyed by fire, will be rebuilt and improved, the work being transferred for the present to another plant which the company operates in Minneapolis.

The Ball Multi-Spark Plug Company, Minneapolis, has had a large and increasing volume of business during the past year, both in supplying the automobile trade and in filling the requirements of other lines utilizing gasoline engines.

The franchise for an electric plant at Berthold, N. D., is reported to have been granted to John K. Moore, Minot, N. D.

Arrangements are now being completed for the construction and equipment of the new dock of the Carnegie Fuel Company at Duluth, which is expected to be ready for operation by August 1. The vice-president of the company, C. F. White, whose headquarters are in Minneapolis, is directing the enterprise.

The authorities at St. Lawrence, S. D., are considering means for the installation of an electric power plant to serve the community.

An engineer engaged for the purpose has prepared plans for a municipal pumping plant and water distribution system at Mandan, N. D., where the matter of equipment will be taken up as soon as the construction details have been definitely decided upon.

The Duluth & Iron Range Railroad Company, Duluth, recently let the contract for the steel to be used in the construction of new ore docks and is now making provision for the handling machinery and other equipment.

From Missoula, Mont., it is reported that the Northwestern Development Company will begin work in the spring on the large hydroelectric plant which it has arranged to build at Thompson Falls. Ed. Donlan, the president of the company, has the plans in charge. Surveys are also being made for transmission lines to Burke, Murray, Wallace and other mining districts in Idaho, to which it is proposed to supply operating power for mining and ore reduction machinery.

At Musselshell, Mont., Handel Bros., it is stated, are back of an enterprise to establish an electric power and lighting plant.

New woodworking machinery has been installed in the plant of the A. L. Jordan Company, Columbia Falls, Mont., and more will probably be needed in the spring.

A large electric power and pumping plant will be built in the spring by the Libby Waterworks, Electric Light & Power Company, Libby, Mont.

An air compressor, drilling machinery and other equipment will be installed in the spring by the Montana Ibex Mining Company, on its property not far from Dillon, Mont. The main office of the company is in Butte, Mont., August Heinbach being president, John Eckel vice-president and Robert Sweininger secretary-treasurer.

The planing mill of the Humbird Lumber Company, Sandpoint, Ida., is being remodeled and considerable new machinery will be installed.

The Idaho Consolidated Power Company, Pocatello, Ida., of which J. H. Brady is president, announces that its hydroelectric plant at American Falls, which is equipped with General Electric generators, of 3000 kw., driven by Leffel water turbines, will be supplemented by another development of about 24,000 kw., constituting the main plant of the system.

C. B. Pride, president of the Tomahawk Pulp & Paper Company, Tomahawk, Wis., has organized, with others, the Coeur d'Alene Paper Company, which will establish a manufacturing plant, to cost about $200,000, in the vicinity of Coeur d'Alene, Ida.

The Virginia Foundry & Machine Company, Virginia, Minn., has purchased a factory site in West Duluth, Minn.

The Duluth Iron & Metal Company, Duluth, Minn., is contemplating the establishment of a branch plant, plans for which have not been prepared.

It is reported from Panama that a railroad ditching machine received from the American Hoist & Derrick Company, St. Paul, Minn., has just been placed in service on the canal. This, it is stated, operates over the tops of the flat cars of a work train and is self propelling, traveling on two portable track sections, which it transfers from one car to another as it proceeds with its work.

The Anoka-Minneapolis Suburban Railway, Anoka, Minn., will begin work in April on an electric line from Anoka to this city, via the U. S. military road.

Advices from Duluth, Minn., are to the effect that an expenditure of $250,000 for new equipment and the extension of its electric transmission system has been decided upon by the directors of the Great Northern Power Company.

The timber-cutting plant of the Northern Idaho Pine Lumber Company at Lane, Iowa, which burned last month, will probably be rebuilt for larger capacity.

Plans for a hydroelectric plant of 2000 kw. or larger, are being made by the Salem Falls Light & Power Company, recently organized at Payette, Idaho.

At Westlake, Idaho, A. Krammers is building a saw mill.

The MacGillis & Gibbs Lumber Company of Milwaukee, Wis., and Spokane, Wash., has established an office at Clarks Forks, Ida., where a large timber cutting plant, electrically operated, will be built shortly.

The County Board of Troy, Mont., has granted a franchise to R. E. Potterfield to install an electric light system.

St. Lawrence, S. D., has under consideration the installation of an electric light plant.

San Francisco

SAN FRANCISCO, CAL., January 3, 1911.

Business was dull during the latter half of December, and so far few new orders have come in, though dealers are

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figuring on a large number of inquiries, and expect an almost immediate improvement over conditions of the last few months. The outlook for machine tools is hardly as good as in other lines, as there are hardly any inquiries for tools of the heavier types. Travelers in this line report a fair business in the north, but very little either here or in the oil fields. It is possible to get almost any kind of tools of moderate size second-hand at low prices, most of the articles offered having been used only a few years, and second-hand tools are being used quite largely in the improvements now under way.

Several recent developments are expected to have a highly beneficial effect on the general machinery market. The Byllesby interests of Chicago have entered the hydro electric and gas manufacturing business on a large scale in the interior of California and Oregon, acquiring several important mountain power sites, and are already putting in improvements at several points. The gas corporations around Los Angeles have consolidated, and plans are being made for a lot of new machinery in connection with the extension of the distributing systems. The extension of the Northwestern Pacific Railroad will require the boring of several tunnels and other work requiring a large amount of contractors' equipment, in addition to rolling stock, &c., required by this and other local railroads. This road has just received six large locomotives from the American Locomotive Company. Some of the larger oil companies have secured financial support which will enable them to proceed with contemplated improvements. Mining interests are in a better position than for several years, and a large amount of dredging machinery, for reclamation as well as mining purposes, will be required during the year.

Machinery dealers and manufacturers are greatly interested in the recent organization of the United Properties Company of California, with a capital stock of $200,000,000. F. M. Smith, who controls the Oakland Traction Company and the San Francisco, Oakland & San Jose Railroad, and W. S. Tevis are at the head of the corporation, which was formed to carry out numerous improvements in the public utilities on the east side of San Francisco Bay.

The Oakland Traction Company is preparing to add a large number of new cars to its system. The San Francisco, Oakland & San Jose Railroad will require considerable equipment this year for the work of filling in its mole and dredging a basin, though most of this machinery will probably be constructed in its own shops.

The city of San Francisco has ordered all supplies for the construction of the Geary Street Municipal Railroad, and if the work proceeds as planned a number of cars will be required before the end of the year.

Creditors have filed a petition in the United States District Court asking that the Pacific Jupiter Steel Company be declared an involuntary bankrupt.

The Westinghouse Electric & Mfg. Company has been testing a new type of motor for oil-well drilling, and expects considerable business in this line in the Kern oil fields, into which a new power line is being extended.

Plans have been completed for the power house of the San Francisco Hospital, in which four steam turbine generators will be installed. The hospital will also require a lot of laundry machinery.

The Imperial Iron & Machine Company has been incorporated at Los Angeles, Cal., with a capital stock of $25,000, by L. V. Boggs, J. A. Strugnell and W. P. Martin.

The Bradrick Machine Works, Porterville, Cal., is planning to start a factory for the manufacture of a new deep well pump.

Several new woodworking machines are to be added to the mill of J. N. Howard at La Mesa Springs, Cal.

The Butte County Pine & Hardwood Company, Oroville, Cal., is preparing to install some new veneer machines.

The Fort Bidwell Consolidated Mines Company, Fort Bidwell, Cal., which recently installed a five-stamp mill, is preparing to purchase a cyanide plant and a portable sawmill.

C. E. Coggins is installing a new machine shop at Imperial, Cal.

The California Canneries Company is completely remodeling its plants at San Francisco and Napa, Cal., replacing its old equipment with sanitary canning machinery.

The Pacific Electric Company, Los Angeles, Cal., is preparing to open a rock quarry on the La Habra division.

The city of Sacramento, Cal., has adopted specifications for a steam pumping unit for the municipal waterworks.

The California Power Company is preparing plans for a new powder works at Antioch, Cal.

It is reported that the Standard Oil Company, which has a large refining plant at Richmond, Cal., will put up a plant of similar capacity at some point on the southern California coast.

The North American Petroleum Company has let a contract to R. C. Andre, San Bernardino, Cal., for 26 derricks and equipment.

North Pacific Coast

SEATTLE, WASH., January 6, 1911.

A development illustrating the changing conditions in this section is to be seen in the fact that the Vulcan Iron Works, Seattle, will practically go out of the supply business, in which it has long had a large and profitable trade. The accumulated stock of small tools, valves, packing, gauges, bolts, nuts, washers, rivets, nails, pipe, fittings and other material carried for quick delivery will be disposed of as soon as practicable, with the object of devoting the entire energy and facilities of the company to manufacturing and heavy repair work, including the production of structural steel and the handling of iron and steel, in which some large contracts have recently been taken. The company now has a thoroughly modern plant and is well equipped in every way for the work indicated.

Plans for extensive improvements at Auburn, about 20 miles south of Seattle, are generally understood here to have been made by the Northern Pacific Railroad, which will make that point a center for the handling of north coast freight. Repair shops, roundhouses, a fuel storage plant, and about 50 miles of yard trackage will be provided for, the total expenditure involving nearly $1,000,000.

The Diamond Iron Works of Minneapolis, Minn., has opened a district sales office in the Realty Building, Spokane, Wash., to look after its growing trade in Eastern Washington, Oregon and Idaho.

William McIntyre, Western Representative of the McDonough Mfg. Company, who makes his headquarters at the Coeuer d'Alene Hotel, Spokane, Wash., is introducing to the trade a drop-forged dog, made of tool steel, which will fit any carriage knee now manufactured.

The Spokane Chamber of Commerce, Spokane, Wash., is considering means for securing additional industries, and it is proposed to have a tract of 1000 acres set aside by the city as the location of free sites to be offered to manufacturers who will establish new plants there.

The city of Raymond, Wash., has completed the installation of a large pumping unit to be used exclusively for fire protection.

The Pacific Tank & Silo Company, recently organized, is arranging for the construction of a manufacturing plant at Chehalis, Wash. W. A. Bricker is vice-president and will serve as manager.

It is reported from Pasco, Wash., that the erection of a large electric generating plant will be begun there shortly by the Pacific Power & Light Company.

The United States Blower Company, Seattle, installed its motor-driven blower systems, during the past year, in many of the larger plants on the Coast.

Improvements now being completed at the mill of the Weyerhaeuser Timber Company, Everett, Wash., include four new boilers from the shops of the Casey & Hedges Company, Chattanooga, Tenn., whose sales in this section during the past year have been considerably extended.

The Johnson Automatic Switch Company, Spokane, Wash., which has been incorporated with $100,000 capital stock, is reported to be planning the erection of a manufacturing plant there and another in the East.

A saw mill and box factory are to be built during the year at Skamokawa, Wash., by the Matthews & Laughlin Company, in addition to the plant recently erected there for the manufacture of shingles.

The Bingen Mfg. Company, recently incorporated at Bingen, Wash., by Suskdorf Brothers, will install machinery for box making in a plant to be built for the purpose.

The Puget Sound Electric Railway, which operates the plant of the Tacoma Railway & Power Company, Tacoma, Wash., is planning to extend its system, thereby necessitating additional power. Current is now taken from the hydroelectric station of another company, but an auxiliary steam plant is maintained.

Arrangements are being made by Leavenworth, Wash., to establish a water works system at a cost of $40,000.

The City Council of North Yakima, Wash., is considering the construction of a municipal water works system.

The Pacific Coast Power Company has under construction on the White River near Tacoma, Wash., a large hydroelectric power plant, in which will be installed the largest hydraulic turbines ever built. The plans call for the construction of a dam, intake canals and power house, and the installation of two power units, each of which consists of a 10,000-kw. generator direct connected to a 20,400-hp. reaction turbine. Provision is made for an ultimate total of six of these units.

Notes on Motor Truck Performances

In the pioneer use of motor trucks experiences were so often disappointing that the belief became firmly intrenched that they cannot compete with horse drawn commercial vehicles. Particularly in reliability and economy, the two principal considerations, they seemed to be then deficient, and it has required much in the way of arguments and demonstrations to combat the popular prejudice still persisting that motor trucks cost more to maintain and are more likely to break down than horses and wagons. Actual performances are the most impressive evidences of the fact that commercial motor vehicles have reached the stage of dependability and offer a reduced cost per ton-mile of material handled, and the following random instances of records made, furnished by the Publicity Department of the Commercial Vehicle Show, Chicago, are therefore interesting:

Coal and Ash Handling

A 5-ton motor coal truck in the service of the Syracuse University hauls an average of 45 tons of coal a day from the Delaware, Lackawanna & Western Railroad coal pockets in Syracuse, N. Y., to the university. The distance is 3 4-10 miles, and three-quarters of the distance is up grade, the average being 7 per cent. and the maximum 12 per cent. One man operates the truck, which is loaded by gravity from the coal pockets, and delivers its loads by gravity through a chute in the side of the steel body into underground coal bins through manholes. In one day recently the truck hauled 46 6-10 tons of coal to the university in nine loads, and in addition hauled two 5-ton loads from the coal pockets to the downtown building of the institution.

A 3-ton motor truck with self-dumping steel body has been used for some time in upper New York City in fulfilling a contract taken by McDonald & Barry to fill in a tract of low ground at Broadway and 204th street. The truck hauls loads of wet ashes from a power house about a mile away. Each load contains 7 cu. yd., or just double the load hauled in a horse-drawn wagon. The motor truck makes 10 to 12 trips a day, as compared with an average of five or six trips made in a working day with horses. Thus the power vehicle is doing the work of four horse-drawn wagons, and is hauling from 70 to 84 cu. yd. of material a day. In this case the saving in time is of especial importance, because the filled ground is to be used for the construction of buildings that are badly needed by the owners.

Large Barrel Trucks

Writing of the work done by two motor trucks fitted with special rack bodies of unusual cubic load capacity, J. B. Wagner of the Federal Cooperage Company, Yonkers, N. Y., says: "Our delivery expense has been considerably lessened since they have been installed. We find that we can accomplish as much work with two of these trucks as we previously could with four teams and with less trouble and anxiety. Heretofore we have had a stable of 10 horses, but since installing these trucks we have reduced that number to two and have eliminated our stable trouble, such as sick horses, &c."

Police Service

Six motor patrol wagons and ambulances have displaced 10 horse-drawn wagons and 36 horses in the Detroit Police Department. The efficiency of this branch of the department has been practically doubled since the installation was made, although considerable economy has resulted from the decreased number of drivers and helpers needed. Up to last September the first motor patrol wagon, which was placed in service last January, responded to 4203 calls and traveled 11,163 miles. The total expense incurred, exclusive of drivers' wages and depreciation, was $731.85. Experienced police officers state that it would require 12 horses and two horse-drawn wagons, four patrolmen and one hostler to provide an equivalent service and that the cost for such an equipment for eight months would be practically $4000.

Delivery Wagons

Averages compiled from actual records of 20 light motor express and delivery wagons operating in as many different lines of trade in Syracuse, N. Y., for periods of time ranging from 6 to 22 months, show annual operation and maintenance costs as follows: Fuel and oil, $168; depreciation estimated at 20 per cent., $180; repairs and replacements, exclusive of tires and ignition batteries, but including repairs due to accidents and drivers' carelessness, $150; drivers' wages, at $12 a week, $624; tires, $50; interest on investment at 5 per cent., $45. This gives a total cost per wagon of $1217 a year. The machines average 50 miles a day. Assuming that two single horse wagons could do the work of one of the motor wagons, and that the cost of stabling, shoeing, drivers' wagons and other items averaged $22 a week, the horse service would cost $2112 a year, or $895 more than the motor wagon. Syracuse is subject to very severe winter conditions and in general has very poor pavements, while many streets are not paved at all. Hence the actual figure of $13.25 per month per car for repairs arrived at by the records of a score of wagons in a variety of services is considered an excellent average upon which to base estimates for maintenance repairs for this particular type of power vehicle.

Six 1-ton motor delivery wagons used by the Chicago Public Library for distributing and collecting books among the branch circulating libraries in the city average 33 miles a day apiece. One has been in regular service since 1904, and several of the others have passed by several years the period for which depreciation was figured. Depreciation is generally estimated now at 20 to 25 per cent., giving the machine an assumed useful life of four or five years. The total annual cost for operation and maintenance is $10,846.62, or an average of $6 per working day per truck. At least 10 horses and wagons and four extra drivers would be needed to do the same work, figuring 20 miles a day as the horse's maximum day-in and day-out capacity. The difference in wages alone would amount to at least $2000 a year. A large reserve equipment of animals would be required, necessitating additional cost for stabling.

Small Motor Trucks

Fourteen longshoremen with hand trucks have been displaced at the Hoboken, N. J., docks of the Hamburg-American Steamship Company, by a three-wheeled platform truck of 1-ton capacity, which has a low platform 5 x 12 ft., without sides, and can travel 24 miles a day on one charge at a rate of 4½ miles an hour. Two similar 1-ton trucks and two three-wheeled trucks with a carrying capacity of 4 tons are used for transferring castings and finished parts from one part of a factory in a large industrial plant to another and between factory buildings. They can be taken on freight elevators to any floor in the factory buildings. The four-motor industrial trucks, which operate independently of rails and have rubber tired wheels, are to-day doing the work of many horses formerly used and a large gang of men.

The Western Steel Corporation.—At its Irondale, Wash., Works the Western Steel Corporation, Seattle, Wash., is just completing the installation of a 9-in. mill and the building of a continuous heating furnace in connection with it. A continuous ingot heating furnace is under construction for the 22-in. mill, and will be ready for operation in a few weeks. The No. 3 open hearth furnace is nearly completed, and a charging machine, built by the Wellman-Seaver-Morgan Company, is being installed. Recently added equipment includes additional shears and a Ryerson friction saw.

The O. K. Wheelock Company, now manufacturing brass and iron bedsteads in Cleveland, Ohio, has decided to remove to McKeesport, Pa., where it will erect a building, 82 x 250 ft., which will be equipped with much new machinery. The removal is made to be nearer the source of raw materials.

Personal

John B. Miles has retired from the engineering firm of Frank C. Roberts & Co., Real Estate Trust Building, Philadelphia.

O. P. Letchworth, president of the Pratt & Letchworth Company, Buffalo, has returned from a European trip.

Frank N. Wells has retired as superintendent and treasurer of the Humason & Beckley Company, New Britain, Conn., to become actively interested in the management of the Beaton & Corbin Company, Southington, Conn., of which his late father was president and of which he himself is vice-president, and his brother, A. R. Wells, secretary and treasurer.

Th. Hansen, formerly superintendent of the Chicago Brass Company, Kenosha, Wis., has identified himself with the Wire Specialty Works of Chicago as superintendent, making a feature of designing and building special automatic machinery.

H. A. Foster, an instructor in the engineering department, University of Cincinnati, Cincinnati, Ohio, has resigned, and on February 1 will take charge of the mechanical department of the Oliver-Schlemmer Company, Cincinnati.

Walter H. Whiteside, president of the Allis-Chalmers Company for the past five years, has resigned, and has been succeeded by D. W. Call, formerly assistant to the president of the American Steel Foundries.

John R. Magarvey, until recently manager of the Brooks plant of the American Locomotive Company at Dunkirk, N. Y., and now manager of the Schenectady plant of the same company, was last week presented with a gold watch by the heads of Dunkirk departments on the occasion of his leaving for Schenectady.

W. M. Lawton has severed his connection with the Lake Erie Nail & Supply Company, Cleveland, Ohio, of which he was sales manager, and has opened an office at 1227 Engineers' Building, Cleveland, where he will deal in machinery, transmission and steam specialties.

F. S. Bigler, who had been with the Upson Nut Company, Cleveland, Ohio, for more than three years, has returned to the Michigan Bolt & Nut Works, Detroit, as general manager, having formerly been with this company 20 years and had been its secretary for 10 years. E. T. Gilbert, who had been the manager for many years, died last August. Other officers of the company are now as follows: E. Y. Swift, president; L. L. Barbour, vice-president; H. MacLean, secretary and treasurer.

Vice-President J. F. Taylor of the Lake Superior Corporation, Sault Ste. Marie, Canada, has been appointed general manager and W. C. Franz has been made vice-president with charge of transportation interests. Consulting Engineer Ernst becomes general manager of the Algoma Steel Company, with C. E. Duncan as general superintendent.

E. C. Wallace, president of Milliken Brothers, Inc., has been elected a director of the National Park Bank, New York.

On the evening of December 31 a dinner was given at the Hotel Plaza, New York, to the heads of departments of Milliken Brothers, Inc., by E. C. Wallace, the president of the company. There were present, besides Mr. Wallace, F. Dykes, the general manager; J. M. Ellis, T. S. Fuller, J. M. Ryan, C. W. Eckhardt, F. H. Boyle, J. E. Jennings, H. M. Ward, S. J. Reeves, R. Harragan, W. T. Voege, L. B. Loomis, C. R. MacCarey, J. P. Pittinger, G. M. Wambold, C. E. Buckton, McC. Reeves, N. W. Place, W. J. Sage, E. H. Frizell, J. C. English, H. K. Ryerson, G. B. Thorne, C. H. Zehnder, Guy Van Amringe, E. J. Kohler, L. F. Doyle, D. L. Hough, P. G. Brown, E. Barlow, C. R. Hedden, H. S. Manning, A. H. Larkin, H. Hodgkiss and J. M. Bowers.

The Philadelphia & Reading Railway Company is reported to have decided to build 23 passenger locomotives at its own shops at Reading, Pa., during the first half of the year.

Obituary

JAY E. SPAULDING, Winsted, Conn., died January 6 from injuries by a fall down a stairway, aged 64 years. He was born in New York City and removed to Winsted in 1866. He was president of the New England Pin Company, New England Knitting Company, Morgan Silver Plate Company and Carter & Hakes Machine Company, and was also connected with other local industries. He leaves a widow and a daughter.

LESLIE M. SAUNDERS, head of the firm of D. Saunders Sons, Yonkers, N. Y., manufacturers of machinery, died January 5, aged 69 years. His father founded the business.

E. E. HANNA, founder and formerly president of the Hanna Engineering Works, died January 5 at his residence in Chicago, aged 49 years. He was a member of the American Society of Mechanical Engineers.

New Railroad Equipment.—Announcement is made that the locomotive order from the Harriman lines, which has been pending for some weeks, has been awarded to the Baldwin Locomotive Works—185 being freight and 11 passenger locomotives. The Baldwin Works will also build 24 freight locomotives for the Pittsburgh, Shawmut & Northern. The Philadelphia & Reading will build 20 passenger locomotives at its Reading shops. The Canadian Pacific has ordered 75 locomotives from the Montreal Locomotive Works and its own shops. The New York, Ontario & Western has ordered 450 coal cars from the American Car & Foundry Company. The Santa Fe has ordered 500 refrigerator cars from the American Car & Foundry Company, and the St. Louis Southwestern will buy 500 refrigerator cars in addition to 1500 box and 500 furniture cars, heretofore reported. The Canadian Pacific recently ordered 2200 cars from its own shops and 1300 from car builders, and the Algoma Central & Hudson Bay is planning to buy 514 cars. The Great Northern, which recently bought 500 ore cars, has also ordered 75 tank cars.

The Apollo Sheet Steel Calendar.—The American Sheet & Tin Plate Company, Pittsburgh, Pa., is distributing the Apollo all-metal perpetual calendar. This is unique, being made entirely of the sheet steel products of the company. The back is made of an Apollo best bloom No. 28 galvanized sheet, 14 x 20 in. The date cards are made of No. 34 annealed sheets, enameled black with dates printed in aluminum. The calendar is handsomely lithographed in four colors, and has a bright chain hanger attached. While the company has given these calendars a wide distribution, the prospects are that a new edition will have to be brought out to meet the demand which has proved very great. It was the intention of the company to place one with every sheet metal shop, supply house and user of sheet and tin mill products in the country.

The Variety Iron & Steel Works Company, Cleveland, Ohio, has secured a contract from the Richard Heckscher & Sons Company, Philadelphia, for the new blast furnace, to be built at the Heckscher plant of the Alan Wood Iron & Steel Company at Swedeland, Pa. The new stock will have a capacity of 350 to 400 tons a day. Work will be started at once, it being the intention to have the stack ready for operation by the middle of summer. Julian Kennedy, Pittsburgh, Pa., is the engineer.

The fire which visited the plant of the Kansas City Bolt & Nut Company, Kansas City, Mo., January 6, completely destroyed the burring room, nutting room and the bolt and nut shipping department. A large part of the plant is of fireproof construction and was not affected. Temporary quarters are being established and shipments will be renewed in a few days. The loss on buildings and stock is about $25,000, covered by insurance. Plans are already under way to replace the burned portions with modern fireproof buildings.

The Lake Superior Iron & Chemical Company

In connection with the recent offering in London of $3,000,000 6 per cent. bonds of the Lake Superior Iron & Chemical Company, Detroit, Mich., a statement is made concerning the properties, based on a letter written by W. H. Matthews, vice-president and general manager. From this the following data are taken:

The company had previously issued $3,500,000 of bonds, and the recent $3,000,000 (of which $2,000,000 has been applied for in England and Canada) makes a total of $6,500,000 out of $10,000,000 authorized. The preferred stock is $1,625,000, and the common stock issued is $8,375,000, out of a total of $10,000,000 authorized. The properties acquired on the reorganization of the company July, 1910, are given as follows:

1. Six charcoal pig iron furnaces, four with chemical and charcoal plants, one with small charcoal capacity, one with long-term contract for charcoal. Pig iron capacity, 198,000 tons per annum.

2. 137,551 acres of hardwood land in fee (111,671 acres virgin forest), and contracts covering the cord-wood on 190,230 additional acres, assures the company a full supply of cord-wood for at least 30 years. Our policy, however, is to make stumpage contracts with outside parties and to hold intact the standing timber, which has great prospective value as lumber.

3. 47 miles of standard-gauge railroad with 90 cars, 11 locomotives, stock cars, boarding cars, &c. This railroad leads from two transcontinental lines and enables the company to operate the woodlands in connection with the various plants most economically.

4. Long lease of the Yale iron mine, which has now blocked out some 800,000 tons of ore, with a large additional amount still undeveloped. Also another only partly developed mine.

Independent Valuation, $5,977,435, with $2,675,000 New Cash for Improvements and Working Capital.

Furnaces and equipment	$1,313,720
Chemical plants and equipment	619,186
Yale Mine (profits, ore blocked out)	825,830
Woodlands, owned in fee	2,662,539
Stumpage contracts, advance payments	145,680
Railroad and equipment	265,069
Lumber camps and equipment	145,411
New Money provided—	
Cash to remodel chemical plants	1,000,000
Working capital (cash)	1,675,000

Concerning the plans for new construction and the expected production the letter says: "It is proposed that the four kiln plants now in use shall be at once rebuilt and remodeled, and a complete new plant built at Chocolay. At the new plants there should be procured between 10 and 12 gal. of wood alcohol from each cord of wood carbonized, instead of 4 gal. under the old method, and from 160 up to 190 lb. of acetate of lime per cord, instead of between 70 and 80 lb. Arrangements made with the Wood Products Company of Buffalo and the United States Industrial Alcohol Company insure preferential terms in this market, and make practically certain that our products will always be taken as rapidly as produced. The presence on the board of the president of the United States Industrial Alcohol Company and of a member of the firm of Rogers, Brown & Co., who have a large financial interest in the company, insures friendly co-operation. The Wood Products Company of Buffalo, which is a subsidiary of the United States Industrial Alcohol Company, handles about 95 per cent. of the wood alcohol made in the United States. Rogers, Brown & Co. (the largest sellers of pig iron in the United States) have undertaken the sale of the pig iron."

The estimated earnings after the remodeling of the chemical plants are given below:

Charcoal pig iron, 198,000 tons, at $3.50 profit	$693,000
Wool alcohol, 3,420,000 gal., at 23 cents per gallon, $786,600; acetate of lime, 61,560,000 lb., at 1.6 cents per pound, $984,960; total net selling value at plant, $1,771,560; less additional fuel and labor costs at chemical plants, $684,000	1,087,560
Total	$1,780,560
Deduct 25 per cent. to cover possible shutdowns, slack trade, &c., Deb	445,140
and add net profits from Yale Mine, say 100,000 tons per annum, at 75 cents per ton, Cr	75,000
Total estimated net earnings before allowing for depreciation and interest charges	$1,410,420

The reports of net earnings, before deducting interest or depreciation, show $503,459 in 1905, $626,494 in 1906, $951,310 for the 16 months ending April 30, 1908, $72,848 for the fiscal year ending in 1909, and $463,503 for that ending in 1910. The low earnings in 1909 are attributed in part to the panic and in part to the disorganization following the death of the chief owner.

December Copper Production and Stocks

The Copper Producers' Association has issued its December report of production and stocks. The decrease in stocks during the month was 8,358,874 lb.; the increase in production was 3,985,756 lb.; the decrease in domestic deliveries was 17,207,974 lb.; the increase in exports was 20,699,759 lb. The report is as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States December 1	130,389,069
Production of marketable copper in the United States from all domestic and foreign sources during December	123,339,219
Deliveries of marketable copper during December:	
For domestic consumption	43,594,018
For export	88,104,075
Total	131,698,093
Stock of marketable copper of all kinds on hand at all points in the United States January 1, 1911	122,030,195

The association has also issued a summary for the year 1910, which shows that the total production of copper was 1,452,122,120 lb., and the total deliveries were 1,471,858,036 lb., showing that the reduction in stocks during the year was 19,735,916 lb.

The Steel Corporation's Unfilled Orders

The monthly statement of unfilled orders on the books of subsidiaries of the United States Steel Corporation, given out January 10, showed that the total on December 31 was 2,674,757 tons, as compared with 2,760,413 tons on November 30, a falling off of 85,656 tons. While the statements for the past three months have shown amounts less than the 3,027,436 tons of September 30, 1904, which previously was the low point in unfilled orders, it is explained that on the present basis of computation the orders on hand September 30, 1904, would have been reported at 2,434,736 tons. At that time inter-company orders were included. The statement for December 31 compares with others of the past two years as follows:

December 31, 1910..2,674,757	March 31, 1910.....5,402,514
November 30, 1910..2,760,413	December 31, 1909..5,927,031
October 31, 1910....2,871,949	September 30, 1909..4,796,833
September 30, 1910..3,158,106	June 30, 1909.....4,057,939
August 31, 1910....3,537,128	March 31, 1909.....3,542,595
July 31, 1910.....3,970,931	December 31, 1908..3,603,527
June 30, 1910.....4,257,794	

The unfilled orders at the close of the years preceding 1908 were as follows: 1907, 4,624,552 tons; 1906, 8,489,718 tons; 1905, 7,005,086 tons; 1904, 4,696,203 tons; 1903, 3,215,123 tons; 1902, 5,347,523 tons.

Continuous Foundry Operation.—In the article by G. K. Hooper in *The Iron Age* of January 5, page 76, two illustrations were given of the arrangement of foundries recently built in the United States, in which the molds are carried to the iron. The second of these was of a two-story foundry in which cupola malleable castings are made. While the context indicated clearly which illustration was meant, the titles of Fig. 2 and Fig. 3 were exchanged by an error in the make-up of the article. What was shown as Fig. 2 was, in fact, a plan and longitudinal section of a foundry in which the iron is carried to the molds.

The Roanoke Bridge Company, Roanoke, Va., recently incorporated, is planning to build a structural steel and bridge plant. The main building will be of steel construction, 35 x 140 ft., with an addition 25 x 90 ft. An office building will also be erected. The total cost of the plant, including machinery, is estimated at $30,000. E. C. McComb is president of the company.

Trade Publications

Ice and Refrigerating Machinery.—The American Machine Company, 500 East Main street, Louisville, Ky. Catalogue. Describes with considerable detail the construction of the American absorption machine. Following this description of the general construction, each part of the machine is described with a view to calling attention to the manner of its construction and the duties it has to perform, the text being supplemented by the illustrations.

Dryers.—The Atlas Dryer Company, Cleveland, Ohio. Pamphlet, entitled "A Thesis on the Art of Drying." Describes the principles underlying the construction and operation of the Atlas dryer for all classes of material.

Compasses and Nautical Instruments.—E. S. Ritchie & Sons, 112 Cypress street, Brookline, Mass. Catalogue. Shows the Ritchie liquid compass, the distinctive feature of which is the attachment to the card of an air chamber that supports almost the entire weight of the card, thus reducing wear on the pivot and increasing the sensitiveness of the compass. The other instruments covered include various types of compasses, binnacles and azimuth and horizontal and vertical force instruments.

Unloading Car Chute.—The Quick Unloading Car Chute Company, Birmingham, Ala. Pamphlet. Concerned with a chute for quickly loading wagons from cars which was illustrated in *The Iron Age* October 7, 1909.

Ventilating Apparatus.—Henry Kroder Company, Passaic, N. J. Pamphlet. Contains a number of views of installations of the You-ree-ka ventilating apparatus, which is said to be the most improved gearing for operating monitor, segment and greenhouse sash. The special advantages claimed for this machine are the opening and closing of three times as many sash as any other device, faster operation and the consumption of less power.

Road Graders.—J. D. Adams & Co., Indianapolis, Ind. Several circulars. Refer to a number of pieces of road making and grading machinery, which includes the Road King, Little Roadster and Road King, Jr., graders, and the Peerless road drag. The special advantage claimed for these graders is adjustable leaning wheels on the land side which counteract the side pressure of the earth against the mold board and prevent all side slipping. The drag is said to be the original tilting blade road drag, in which the pitch of the blades is under perfect control and the angular travel on the road can be regulated.

Gasoline Engines.—Althaus, Ewing & Co., Bluffton, Ohio. Folder. Concerned with gasoline engines for small machine shops. Two sizes of engine, 1 and 4 hp., are built and the general features of their construction are described.

Bolt Cutters, Nut Tappers and Pipe Threaders.—Wells Brothers Company, Greenfield, Mass. Catalogue No. 28. Size 4¾ x 7⅝ in.; pages 51. Illustrates and describes with full specifications the complete line of Little Giant bolt cutters, nut tappers and pipe threaders. An illustrated description of the Little Giant automatic die head appeared in *The Iron Age* April 28, 1910.

Grinding Machinery.—Buffalo Emery Wheel Company, 127 Ash street, Buffalo, N. Y. Several circulars. List a number of foot and belt power grinding machines as well as various styles and shapes of emery wheels.

Reinforced Concrete Construction.—The Turner Construction Company, 11 Broadway, New York City. Bulletin No. 9. Is descriptive of reinforced concrete construction for factories and warehouses and illustrates two typical contracts which were recently completed. Of special interest are two pages giving details for attaching shafting, piping, &c., to concrete.

Gas and Gasoline Engines.—Columbus Machine Company, Columbus, Ohio. Pamphlet. Points out the advantages of the Columbus engine for operation by gas, producer gas and gasoline. Special engines for operating electric generators, geared pumping and hoisting engines and a portable engine are shown, as well as an automatic suction gas producer.

Boiler Feed Pumps.—The Platt Iron Works Company, Dayton, Ohio. Bulletin No. 555. Relates to the Smith-Vaile boiler feed pumps. The styles covered include packed piston, outside center packed plunger, outside end packed plunger and vertical packed pumps in both duplex and simplex types and automatic feed pumps and receivers, steam actuated general service pumps and triplex boiler feed and general service pumps. All the different styles of pumps are illustrated and there are a number of extensive dimension tables included.

Motor Trucks.—R. L. Morgan, Worcester, Mass. Folder. Gives brief description and specifications for a 5-ton truck.

Condensers.—C. H. Wheeler Mfg. Company, Lehigh avenue and Eighth street, Philadelphia, Pa. Bulletin No. 12. Deals with the Wheeler surface and jet condensers and contains a number of illustrations of the various types.

Gas and Gasoline Engines.—C. H. A. Dissinger & Brother Company, Wrightsville, Pa. Two catalogues. The first, A, relates to a line of stationary and portable gas and gasoline engines which are made in sizes ranging from 3 to 140 hp. The various engines are illustrated and the special features of all of them are illustrated and described at length. Catalogue B relates to the Capital gasoline traction engines, which are made with both single and double cylinders in sizes ranging from 18 to 80 hp. for a large number of speeds in both directions.

Cinder Cars.—Weimer Machine Works Company, Lebanon, Pa. Loose leaf circulars. Illustrations and descriptive matter explain the operation of a number of tilting cars for conveying cinders and molten metal. These cars can be furnished to operate either by hand power, steam, air or electricity. An illustrated description of one of these cars appeared in *The Iron Age* January 5, 1911.

Protective Paint for Iron and Steel.—Smooth-On Mfg. Company, 572 Communipaw avenue, Jersey City, N. J. Booklet. Describes the latest Smooth-On product, which is known as Smooth-On Protective Paint for Iron and Steel. This paint is designed to permeate the pores of the iron or steel, thus furnishing a positive and lasting protection to the metal.

Lathes and Attachments.—Foster Machine Company, Elkhart, Ind. Circulars A to J, inclusive. Deal with various types of turret lathes of both the plain, geared friction and set over head types, and attachments such as die heads, knurling tools, slide rests and chucks. All of the various tools and attachments are illustrated and brief specifications are given.

Laboratory Appliances.—The Braun Corporation, 363 New High street, Los Angeles, Cal. Catalogue. Size, 6 x 9 in.; pages, 88. Pertains to a complete line of laboratory appliances, which includes pulverizers, crushers, ore samplers, furnaces of various types, burners, cupel and briquetting machines, cyanide plants and electrolytic outfits. Each of the various appliances is illustrated and a brief description with tables of dimensions is given.

Lathes.—Flather & Co., Nashua, N. H. Several circulars. Call attention to a line of change gear lathes, the swings of which range from 13 to 28 in., and a 13-in. engine lathe. The make up of all the circulars is the same, an illustration of the tool being given on an inside page, with specifications on the facing page.

Presses.—William R. Perrin & Co., Loomis and Forty-sixth streets, Chicago, Ill. Two catalogues. No. 9 points out the advantages of a line of filter presses for all kinds of industrial purposes. No. 10 gives general description and specifications for a number of hydraulic presses, capable of exerting pressures ranging from 20 to 300 tons.

Lathes.—Bradford Machine Tool Company, Cincinnati, Ohio. Catalogue. Size 6 x 9 in.; pages 80. Illustrated. Pertains to a line of lathes which includes the standard triple geared lathes, quick change gear lathes and tool room and turret lathes. The description of the features common to all the tools is given first and is followed by specifications of the different lathes which are given on the pages facing the illustrations.

Elevators.—Warsaw Elevator Company, Warsaw, N. Y. Loose leaf catalogue. Size 9 x 12 in. Describes and illustrates several types of passenger and freight elevators and electric elevator machines and plunger hydraulic sidewalk hoists.

Clay Working Machinery.—The Anderson Foundry & Machine Works, Anderson, Ind. Catalogue. Illustrated. Calls attention to the dry press system of making pressed building, front, ornamental and fire brick. The various machines required include a brick press, a disintegrator, a dry pan, clay pulverizers, mixers and feeders. All of these machines are described and brief tables of dimensions and specifications are included.

Gas and Gasoline Engines.—The Perkins Wind Mill Company, Mishawaka, Ind. Catalogue No. 52. Illustrates and describes a line of gas and gasoline engines which are made in both air and water cooled cylinder styles for portable and stationary use. The special features of these engines are illustrated and described and space is given to a number of accessories designed to be operated by these engines, such as pumps, hoists, feed grinders, saws, &c.

Gasoline Engines.—The National Engineering Company, Saginaw, W. S., Mich. Catalogue. Illustrates and describes the New Model and Michigan gas and gasoline engines, pumps and pumping jacks. The New Model engine is built in one size, 2 hp., in three styles, while 12 sizes of Michigan engine, ranging from 3½ to 50 hp., are constructed. If desired the New Model engine and the four smaller sizes of Michigan engine can be furnished equipped with deep well pumping attachments.

Corrugated Copper Gaskets.—Hampden Cornice Works, Springfield, Mass. Folder. Illustrates a line of circular and rectangular corrugated copper gaskets and gives prices for all the different sizes made.

Sewer Pipe.—Blackmer & Post Pipe Company, Wainwright Building, St. Louis, Mo. Catalogue. Illustrates a line of salt glazed vitrified sewer pipe of both standard and double strength, drain tile, wall coping and conduit tile, and fire clay

flue lining, chimney pipe and chimney tops. Prices are given for all the different sizes of the various products and the special fittings used with each kind are illustrated.

Electric Light and Electric Appliances.—General Electric Company, Schenectady, N. Y. A pamphlet and three bulletins. The pamphlet, which is No. B-3006, is a reprint of a paper read before the National Electric Light Association on the subject of "Street Illumination." It compares the results obtained from the use of luminous and flaming arcs with those resulting from the use of open and closed carbon arcs and the subject which is discussed in detail is treated from the viewpoint of an illuminating engineer. There are numerous illustrations showing the illumination in various cities. Bulletin No. 4602-B is the third edition of the company's publication on automatic voltage regulators for direct current generators. No. 4782 illustrates and describes exciter panels for use in connection with alternating current generator panels when for any reason separate control of the exciter is desired. A complete description of these panels, together with a diagram of the wiring connections and table of dimensions is included. No. 4786 describes a simple motor signal having mechanism suitable for either two or three position operation in either of the upper or the lower quadrant. This mechanism is also applicable to either top or bottom mast operation with only slight modifications. Interior and exterior views of the signal and a detailed description of it and the apparatus used in connection with its operation are included.

Gas Furnaces.—The Westmacott Gas Furnace Company, Inc., Providence, R. I. Circular. Contains a number of illustrations of different styles of heating, annealing and muffle furnaces, brazing tables and shop forges. Brief specifications of the various types are given under the illustrations.

Furnace Reversing Valves.—The S. R. Smythe Company, Pittsburgh, Pa. Pamphlet. Refers to the Schild reversing valve for gas or air which is designed for use in steel, iron and glass furnaces and for all industrial purposes where it is necessary to reverse the direction of the gas or air flow. The special advantages of this valve over other types now in use are given at length and there are illustrations showing the construction of the valve.

Drawing Materials.—The Frederick Post Company, 214 South Clark street, Chicago, Ill. Catalogue and price list. Size 4⅛ x 5¾ in.; pages 446. Describes with numerous illustrations a very complete line of drawing materials and mathematical instruments. A fairly comprehensive list of books on scientific subjects occupies 22 pages, and a 12-page alphabetical index completes the catalogue.

Metal Goods.—Acorn Brass Mfg. Company, Green, Fulton and Peoria streets, Chicago, Ill. Loose leaf catalogue. Covers an extensive line of metal goods made from brass, copper, steel, zinc, aluminum, bronze, German silver and nickel, which includes sight feed oil pumps, priming cups, brass connections for tubing; gasoline, pressure and storage tanks, and various kinds of stamped, drawn and spun metal goods.

Metal Sheets.—The Stark Rolling Mill Company, Canton, Ohio. Folder. Concerned with Alumaloyd sheets which are special steel sheets coated with an alloy of aluminum. One of the features claimed for these sheets is absolute freedom from rust and paint scaling.

Mining and Milling Machinery.—The F. M. Davis Iron Works Company, Eighth and Larimer streets, Denver, Colo. Five catalogues. No. 32 calls attention to a line of mine supplies including ore cars, ore and water skips, mining cages and track. No. 35 is devoted to power transmission machinery and contains a large number of dimension tables. No. 37 illustrates and describes various kinds of ore milling machinery, while No. 38 treats of smelter machinery. No. 43, relates to the Ferraris mill which is a modification of the standard type and is especially adapted to the wet crushing of ores for concentration, cyanidation, &c.

Pipe Threading and Cutting Machinery.—The Merrell Mfg. Company, Toledo, Ohio. Bulletins No. 14 to 21. Illustrations and descriptive matter explain the operation of an extensive line of pipe threading and cutting machinery. Among the different machines shown are pipe and nipple mills, portable hand machines, combined hand and power machines and motor and engine driven machines.

Refrigerating Machinery.—Buffalo Refrigerating Machine Company, 126 Liberty street, New York City. Bulletin No. 11. Shows a line of ice making and refrigerating machinery, ranging in capacity from 3 to 100 tons.

Drilling Machines and Saws.—Frontier Iron Works, Letchworth and Grant streets, Buffalo, N. Y. Loose leaf circulars. Cover a line of drilling and tapping machines and power hack saws. Illustrated descriptions of two of the tools, the Modern 20-in. drill press and a 16-in. high speed geared drilling and tapping machine, appeared in *The Iron Age* May 19 and October 27, 1910, respectively.

Steam Turbines.—The Ball & Wood Company, Elizabethport, N. J. Brochure. Size 6 x 9 in. Relates to the Rateau-Smoot impulse turbine which this company is building for high, low and mixed flow pressures. The special feature of the new mixed flow type is the employment of a straight low pressure turbine with supplementary wheels so as to use high pressure steam economically by an automatically controlled governor.

Wire Lath.—Roebling Construction Company, Fuller Building, New York City. Pamphlet. Treats of the Roebling standard wire lath, which is made in a number of different meshes and shows some of the uses to which it may be put.

Cotton Ginning Machinery.—Gullett Gin Company, Amite, La. Catalogue, 9 x 12 in.; pages 56. Illustrations and descriptive matter explain the operation of a line of machinery for elevating, cleaning and baling cotton and handling the refuse. Drawings showing the way of locating and setting the complete ginning outfits are included.

Panel Boards and Cabinets.—Crouse-Hinds Company, Syracuse, N. Y. Catalogue. Size 9 x 12 in.; pages 80. Deals with a complete line of panel boards and cabinets. Each feature of their construction is tersely described and the listings and prices of individual and assembled parts are clearly presented. Panels and cabinets are listed separately and together so as to render estimating easy.

Rivet and Screw Machinery.—The E. J. Manville Machine Company, Waterbury, Conn. Four catalogues. C2 deals with a single stroke, open die header for wood screw blanks, rivets, headed pins, tire bolts, &c., which was illustrated in *The Iron Age* September 1, 1910. I pertains to a line of automatic wood screw pointing and threading machines for pointing and cutting the threads on common gimlet point wood screws. An illustrated description of one of these machines appeared in *The Iron Age* July 7, 1910. J describes and illustrates automatic screw blank pointers, while K is concerned with automatic shaving slotting machines for shaving and slotting wood and machine screws. An illustrated description of one of these machines appeared in *The Iron Age* December 1, 1910.

Motor Driven Grinders.—Ransom Mfg. Company, Oshkosh, Wis. Loose leaf circulars. Refer to a line of grinders driven by either direct or alternating current motors. Included among these is a 27-in. disk grinder, an illustrated description of which appeared in *The Iron Age* October 14, 1909.

Cold Storage Insulation.—The Union Fibre Company, Winona, Minn. Illustrates the use of various kinds of fiber and cork insulation for cold storage work.

Band Cut-off Saw.—Butterworth & Lowe, Grand Rapids, Mich. Circular. Describes a band cut-off saw for cutting off logs, timbers, &c., as a substitute for the circular and drag saw machines.

Lock Washers.—Hobbs Mfg. Company, Worcester, Mass. Catalogue and price-list. Shows the various types of the American lock washers and gives dimensions, code words and prices for the various sizes.

Steel.—Colonial Steel Company, Pittsburgh, Pa. Catalogue No. 9. Covers the various brands of crucible high grade open hearth steel made by this company. The special features of the various brands of steel are given, with hints on their treatment. The various sizes are priced and a number of tables of weights completes the catalogue.

Woodworking Machinery.—Baxter D. Whitney & Son, Winchendon, Mass. Three pamphlets. The first covers a line of wood planing machinery, the second is concerned with wood scraping and knife grinding machines, while the third describes the Whitney double spindle shaper and the Whitney back knife gauge lathe.

Gas Producers and Engines.—The Otto Gas Engine Works, Thirty-third and Walnut streets, Philadelphia, Pa. Bulletin No. 11. Refers to the Otto suction gas producer, which is made in sizes ranging from 10 to 300 hp., and engines designed to be operated by producer gas. The various types of engines and producers are illustrated and tables of dimensions are included.

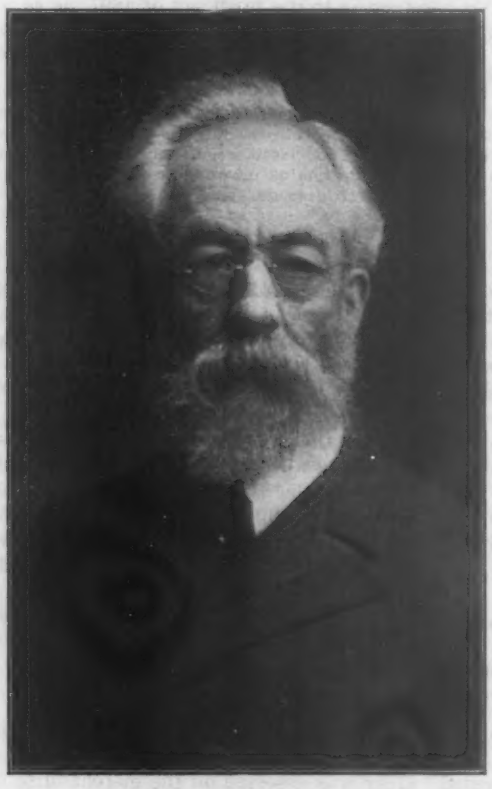
American Swiss Files.—American Swiss File & Tool Company, office at 24 John street, New York, and works at Elizabethport, N. J. Catalogue, 8 x 10 in.; pages 16. Covers the company's line of fine toolmakers' files, which is its specialty. These files are an exact reproduction of the best Swiss "files of precision," and are produced by improved methods with gas as a fuel in all heating processes. The catalogue gives full illustrations of the various styles and reproductions are given of the cutting surfaces of the ten different grades, showing the variations from the coarse No. 00 to No. 8. The No. 8 file is exceedingly fine. The styles shown comprise a very great variety, adapted to the exacting uses of toolmakers who desire accurately finished files for work requiring precision.

Attrition Mills.—The Buckeye Iron & Brass Works, Dayton, Ohio. Pamphlet. Describes and illustrates the American attrition mills, the special features of which include ring oiling bearings of ample proportions lined with high grade babbitt metal, ball thrust bearings and a quick release for allowing the disks to separate when necessary and return to their grinding position without disturbing the adjustment in any way. Seven sizes in all are built and a brief table giving the principal dimensions of the various sizes completes the pamphlet.

Death of Charles H. Morgan

Charles Hill Morgan, president of the Morgan Construction Company and the Morgan Spring Company, and one of the greatest of the world's inventors and developers of rolling mill and wire drawing machinery, died at his home in Worcester, Mass., January 10, aged 80 years. He was a man of remarkable talents. A great inventor, whose name is known as such everywhere that steel and wire are manufactured, he possessed, in combination rare with a creative mind, the power of a thoroughly capable business administration and the faculty of surrounding himself with a group of brilliant engineering assistants.

Charles Hill Morgan was born January 8, 1831, in Rochester, N. Y. His parents were of old New England stock, but the father being a mechanic of limited means the boy's education was that of the district schools of 70 years ago and of short terms in Lancaster Academy,



CHARLES H. MORGAN.

Lancaster, Mass. At 12 he was at work in a factory. At 15 he entered the machine shop of his uncle, J. B. Parker, Clinton, Mass., as an apprentice. When he was 17 years old he determined to learn mechanical drawing, and his efforts resulted in a class for the study of the subject, taught by the late John G. Hoarley, an honored member of the American Society of Mechanical Engineers, then the civil engineer of the Clinton Mills. Those few lessons, taken at night, after 12 hours of labor in the shop, constituted an all-important factor in Mr. Morgan's early mechanical career.

. In 1852, at the age of 21, Mr. Morgan was placed in charge of the Clinton Mills dye house. He applied himself with much zeal to the study of chemistry and filled the position with entire success, gaining valuable experience in the management of subordinates. For a time he was draftsman for the Lawrence Machine Company, and from 1855 to 1860 served as mechanical draftsman for the distinguished inventor and manufacturer, Erastus B. Bigelow. The young man was brought in intimate contact with Mr. Bigelow and Charles H. Waters, the agent of the Clinton Wire Cloth Mills. It was an atmosphere of invention which was a stimulating influence toward the development into greater things. During this period Mr. Morgan introduced a system of designing and constructing cam curves for looms which proved of great value, and was later the subject of a paper read before the Worcester Polytechnic Institute, and subsequently published by Mr. Morgan in pamphlet form. In 1860 he went to Philadelphia, where with his brother, Francis Henry Morgan, he was engaged for two years in the manufacture of paper bags. Here was developed the first automatic machine for making bags. After a few years the business was sold to good advantage.

Becomes Superintendent of Washburn & Moen Shop

In 1864 Mr. Morgan was recommended by friends to Ichabod Washburn, who was in need of a superintendent for his wire works at Worcester. Mr. Washburn engaged Mr. Morgan as superintendent of manufacturing for the firm of Washburn & Moen, and four years later when a joint stock company was organized he was made the general superintendent. For 11 years he was a director of the corporation. He made frequent trips abroad for the purpose of visiting the mills of England, Belgium, Germany, France and Sweden. From these experiences and from the study of publications devoted to wire manufacturing and of the patents issued both in Europe and America, he kept himself thoroughly informed of all changes or improvements. The direct fruits of this knowledge were the increased excellence, variety and amount of the company's products.

The Morgan Mill

The life of Charles H. Morgan was most conspicuously identified with the development of the continuous rolling mill, known the world over as the Morgan mill. The first of the type was designed and constructed by George Bedson, in Manchester, England. The Washburn & Moen Company purchased one of these mills and erected it in Worcester in 1869. It constituted a great advance over previous practice. Experience soon proved that the methods of handling the product of the mill were inadequate, and the first important step in the development of the process was the power reel invented by Mr. Morgan to replace the old hand operated reel. His second and very important contribution to the system—that, in fact, which marked the great difference between the Bedson mill and the Morgan mill—was the practical development of a continuous train of horizontal rolls. The Bedson mill had alternate sets of horizontal and vertical rolls. In the Morgan mill intermediate twist guides were provided, which gave to the metal the necessary quarter turn as it passed between the successive sets of rolls. The design proved so successful that it is the only type of continuous mill in use to-day. Nine years after the construction of the Bedson mill, a new type was built from Mr. Morgan's designs on the Belgium and continuous plans, and was known as the combination mill. The third improvement was the invention by Mr. Morgan of automatic reels, both of the pouring and the laying types, such as are now in common use in every rod mill in the world. They were completed and a successful test made March 10, 1886.

In 1887, after 23 very active years as general superintendent of the Washburn & Moen Works, Mr. Morgan was led by declining health to resign his office, with the purpose of taking up less arduous duties. Some years before, in 1881, he had founded, with his brother, Henry F. Morgan, the Morgan Spring Company, for the manufacture of springs, and was therefore a pioneer in a line of business now carried on by many concerns.

Forms the Morgan Construction Company

Manufacturers of steel products sought his advice in engineering problems, and his reputation as an engineer was widely extended by the new field of his activities. The work led directly to the formation in 1891 of the Morgan Construction Company, Worcester, manufacturer of rolling mill and wire drawing machinery. Mr. Morgan and his associates in the company have been most successful, and their designs and machinery have been widely adopted by appreciative manufacturers in this country and in Europe. The continuous rolling of such materials as billets, sheet bars, merchant bar, rods and hoops, together with the disposition of the product after it has been rolled, has been given special attention, and a

large number of important installations have been made. The continuous method of heating billets, while not strictly new in itself, has been skillfully developed and introduced culminating in the continuous gravity discharge furnace invented by Mr. Morgan.

In 1899, while he was in Europe, Mr. Morgan received a cablegram announcing his nomination to the presidency of the American Society of Mechanical Engineers, an office which he had never sought, and in the following December he was unanimously elected. In 1893 he was one of the Board of Judges of the World's Exposition at Chicago. He was a member of the American Institute of Mining Engineers, the Iron and Steel Institute, and the Engineers' Club of New York.

His Work in Behalf of Industrial Education

Mr. Morgan made a careful study of educational institutions and was closely identified with the establishment, growth and success of the Worcester Polytechnic Institute, having served as a member of the board of trustees from the establishment of the institution, 45 years ago, to his death; in fact, the life of the institute is closely woven into that of Mr. Morgan. In March, 1866, Ichabod Washburn made his gift which established the machine shop and working mechanical department of the school. This branch of the institution was unique in its day, for it was to all intents and purposes to be a business department and not a school. The coming of the students into the shop for instruction was to be an important factor of their curriculum, but this was a feature which was added to an establishment complete in itself without them. Much anxiety was felt as to the success of the plan. Mr. Washburn was old and in feeble health. There was nothing to pattern from. So far as the trustees could learn there had been no instance in this country, and few in the world where an institution of education had successfully conducted a manufacturing establishment unless the work was of the cheapest and simplest character. The Washburn shops were to make complicated machinery. Mr. Washburn recommended Mr. Morgan to the trustees as one of their associates, with the expectation that he would give the shop the advantages of his great mechanical genius and large experience. Mr. Washburn's death occurred before the building was completed, and Mr. Morgan took charge of the work and selected Milton P. Higgins, now president of the Norton Company and Norton Grinding Company, as the superintendent. Together they worked out the details to an eminently successful termination. Mr. Morgan's interest and active co-operation in the affairs of the mechanical department of the Institute have been of inestimable importance. He was one of the founders of Plymouth Church, Worcester, was the first superintendent of its Sunday school, and for many years served on the Board of Deacons. He was a large contributor to educational and religious institutions.

He was married twice, his first wife dying a few years after marriage, leaving one son, Charles Henry Morgan. His second wife is living, with two daughters and two sons, Paul B. Morgan of the Morgan Construction Company, and Ralph L. Morgan.

At the Baldwin Locomotive Works, Philadelphia, the number of locomotives built in 1910 was 1678. The number of men on the pay roll at the close of 1910 was 16,230, as compared with 16,400 in the late summer months, the latter being the highest figure reached since the panic of 1907. In 1906 these works built 2666 locomotives; in 1907, 2663; in 1908, 617, and in 1909, 1023. The maximum number of men employed in 1906 and 1907 was 19,000. In 1908 the minimum number was 4400; in 1909 the range was from 5000 to 11,000, and in 1910 from 11,000 to 16,400. Vice-President Johnson says of 1911: "We do not look for anything more than a moderate year in 1911, but we do not think business will get as low as it was in 1908 by any means."

The Robb Engineering Company, Ltd., has purchased the Robb-Mumford Boiler Works at South Framingham, Mass. The management and manufacturing organization will be continued as at present. The company also operates works at Amherst, N. S., Canada.

Customs Decisions

Steel Railroad Ties

The Board of United States General Appraisers in overruling a protest filed by Joseph Blank holds that railroad ties of steel, cut to proper lengths and with bolt holes punched at both ends, are further advanced than the uncompleted forms of steel as material for which provision is made under paragraph 131 of the tariff act of 1909. The merchandise was assessed at the rate of 45 per cent. under the provision in the present tariff law for "manufactures in chief value of metal," whereas the importer alleged that it should be allowed to enter at a rate proportioned to the value under paragraph 131, as "steel not specially provided for." General Appraiser Fischer, who writes the decision for the board, discusses at considerable length the classification of the articles. Referring to the tariff act of 1897, he says:

> The analogous provision in paragraph 131, Tariff Act of 1909 reads, "steel not specially provided for," and the change so made in the wording of the provision indicates beyond doubt that Congress had in mind by this catch-all clause only unfinished forms of steel as "material." This view would exclude therefrom finished steel, railroad ties, ready for special use, and such articles would find classification under paragraph 199, as herein assessed. The line as drawn between the steel as "material" and the article made therefrom requires no extended comment. The collector's assessments are affirmed and the protests overruled.

Plow Parts

It is held by the board that parts of plows cannot be given the same rate of duty under the tariff act of 1909 that is accorded to plows. W. White appears as the importer in the case, his entries of parts of plows being assessed at the rate of 45 per cent. under the tariff provision for "manufactures in chief value of metal." Objection is made by the importer to the rate assessed by the collector, it being alleged that that the goods should have been assessed under the provision of paragraph 476 of the Payne Tariff act which provides for "plows," with a duty of only 15 per cent. General Appraiser Fischer says in his decision for the board that it is admitted that the articles are parts of plows. Under these circumstances the board feels constrained to overrule the protests and affirm the action of the collector in assessing the higher rates.

Embossing Machines

A claim by the Enger-Kress Pocket Book Company regarding the classification of embossing machines was overruled. Duty was assessed on the merchandise at the rate of 45 per cent. under paragraph 199 of the Aldrich Tariff act, which provides for articles of metal. The contention of the importers was that the machines should be allowed to enter at 30 per cent. as "printing presses." The decision for the board, overruling the contention, states that the protestants failed to appear before the board and have offered no evidence in support of the claim as filed. According to the board, there is nothing in the record to warrant a disturbance of the collector's assessment. It is therefore affirmed.

Hand Brick Presses

The board has made a ruling regarding the classification of so-called hand brick presses imported by John Worley. A duty of 45 per cent. was exacted under the metal schedule, whereas the importer held that the articles fell under the provision in paragraph 197 for presses, by virtue of the provisions of paragraph 481, which is known as the similitude clause. Under the claim as filed by the importer, the rate of duty would have been 30 per cent., but this contention the board denies. The decision says: "There has been no proof offered that this brick press is dutiable directly under the provisions of paragraph 197, and it is not apparent how recourse can be had to the provisions of paragraph 481, to make it so dutiable since the machine is made of, or in part of, metal. The protest is overruled and the decision of the collector affirmed."

Briquettes from Cast Borings

Results from Their Use in Making Iron Castings, with Special Reference to Cupola Reactions—Unsatisfactory Experience with Unbriquetted Borings

Two articles on the manufacture and use of cast borings briquettes have appeared recently in *Stahl und Eisen* (pages 1759 and 2063 of Vol. 30), which are of sufficient importance to warrant extended notice, in view of the coming prominence of the matter in foundry circles in this country. The first one is by E. Leber, foundry superintendent and engineer of the firm of A. Borsig of Tegel, Berlin, who are financially interested in the Ronay method of briquetting cast borings, which is discussed in the article. He states that one of the interesting phenomena observed when melting these briquettes is the great drop in total carbon, thus bringing about results which are very desirable and not heretofore obtainable in the cupola. Evidently he has not thought of what steel scrap additions can do in this line. With this reduction in the total carbon, there is a similar action on the silicon and increase in the sulphur and—what seems to have escaped general notice—a slight increase in the manganese. The latter is contrary to the accepted understanding, manganese being supposed to burn out readily, thereby even protecting the silicon somewhat.

Theories in Explanation of Results

In order to account for the increased strength of castings where these briquettes are used, Mr. Leber passes by the effect of the lowered total carbon and credits it to the stationary or even increased percentage of manganese. This increased percentage of manganese one gathers to be the result of concentration in melting, taking into account the melting loss.

Tests made by a number of investigators with these cast borings briquettes have shown that they readily withstand disintegration in the cupola, when properly made, and that they melt just as pig iron. The specific gravity being 5.9, an open structure would be indicated, which Mr. Leber therefore holds permeable to gases in a very free way as soon as heating up expands them. He claims that in this way the loose graphite is burned away before melting takes place, and a porous structure results. Sulphur vapor striking through this structure unites with the iron, rapidly forming an iron sulphide, thus accounting for the increase in this element noted. It is therefore desirable to use low sulphur cokes. A further observation is on the comparatively short life of the metal in which these briquettes are used; for this reason very hot metal should be made in the first place. In order that the high sulphur may not prevent the formation of graphite in the casting in too great a measure, Mr. Leber recommends the addition of a little ferrosilicon in the ladle.

In discussing the probable action of these briquettes, Mr. Leber states that contrary to the opinion of R. Moldenke (who holds the prevalence of pin holes, gas pockets, &c., in the castings to be due to oxidation of the metal) these phenomena have now been proved to be due to sulphur only. The proofs are not given in the article, however. Sulphur lowering the melting point, giving off gases, thickening iron and deadening it—all are interesting points if entirely correct. In spite of this arraignment of the cast boring briquette, Mr. Leber states that since we have learned how to use it properly these bad results have been overcome and very fine castings have been obtained. He does not give details of "before using" and after, and hence one is tempted to think that he has overhauled his melting practice generally and put it on a better basis.

The balance of the article elaborates a somewhat vague theory on the behavior of the silicon in iron in the cupola, and the probable cause for the increase of manganese from 0.33 in the mixture to 0.50 in the result; the melting loss of the heat being considered 8 to 10 per cent. in these tests with 100 per cent. briquettes. In this country we would probably lose no further time with the matter until the analyses had been checked up—if this were still possible. The silicon dropped from 2.51 to 1.27 in the heat cited, which seems abnormal also.

Inasmuch as Mr. Leber overdraws the possibility of these briquettes being so porous, he is entirely off in his manganese deductions, and has yet to learn something about oxidation of metal in the cupola—the melting loss above noted being evidently partly due to bad melting practice—and, further, as these briquettes are really very fine, melt readily and without showing any greater troubles than good machinery scrap, one concludes that the article in question is another example of "save us from our friends."

The Use of Cast Borings in the Cupola

The second article, by Engineer Messerschmidt, is historical and deals with the development of the practice of using cast iron borings in the cupola. One of the oldest methods, and said to be quite satisfactory in every way, was the cutting of an opening in the lower part of the cupola at one point, attaching a hopper outside, and by means of a spiral conveyor forcing the borings into the cupola as wanted. The use of this material in crucibles and the air furnace is comparatively simple, the special precaution to be taken being to secure absolute dryness, so that there may be the least possible loss in temperature. This is seen more particularly when borings are added in the ladle. Unless perfectly dry small explosions occur, but, worst of all, the author has it, the steam formed decomposes into hydrogen and oxygen, the former uniting with the iron and causing all kinds of trouble. Silicon has a tendency to prevent this action and manganese aids in the hydrogen absorption. (The query might arise, Why does the hydrogen do this, and why not the oxygen of the steam, or does this go into the atmosphere?) Mr. Messerschmidt differs from Mr. Leber as above quoted, holding that the dissolved gases come out in setting and cause pin holes, &c., not through the sulphur present but the hydrogen. He even adds that the nitrogen of the atmosphere which the borings have absorbed is a very bad thing for the molten iron to which these have been added, not only making a casting porous but even brittle. Mottled and white pig iron contains 0.04 per cent. nitrogen and gray iron pigs 0.009 per cent. nitrogen, in addition to the bubbles observed in the surface of the metal. Hot melting prevents absorption of gases, whereas cold iron promotes it, and the addition of the borings in the ladle by cooling the metal is supposed to add nitrogen to the material. A further difficulty in adding the borings to molten metal in the ladle lies in the inability to mix uniformly, as well as allowing the graphite contained to be taken up by the upper metal in the ladle only, making it exceptionally high in total carbon as against the lower portions of the ladle content. A state of saturation takes place in the upper part of the molten metal, preventing further dissolving power on the part of the cupola metal and a very bad mess is the final result. There is, further, the heavy oxidation of the floating chips, which does not improve things. Wherever possible, material of this kind should be brought under a protecting cover of slag, as would be the case in the air furnace.

Heavy Melting Loss

Charging cast borings directly into the cupola brings with it an enormous melting loss. Tests made give this at about 50 per cent. G. Whitney's process in the United States, dating back to 1872, is next mentioned, the borings being charged into wooden boxes. The difficulty with this process is a self-evident one. If the cupola is run very hot the melting zone is fairly close to that portion

above where the ascending gases begin to give off enough of their heat to be effective in warming up the charges. Hence the wooden boxes have not far to go down before they get into the melting zone. Oftentimes the envelope had not been fully burned away before the loose borings would be in the midst of things, and in this case the results were fairly good. If, on the other hand, an excess of coke was used and the heats ran slow, the boxes would be burned away far up and have their contents emptied out into the cupola before they got anywhere near the melting zone. Between these uncertainties and the high price of wood, the process was not generally used. Cast iron and sheet steel boxes replaced the wooden ones, and the results were always better when the borings were thus treated. Of the many foundries trying this method out, all have abandoned it as unreliable. Another method was to use the "over iron" of a foundry and pour over borings previously put into the metal pig bed. This also proved unsatisfactory.

The Behavior of Briquetted Borings

The more recent methods consist in briquetting the loose chips under enormous pressures either direct or with the addition of a binder. Here a solid material is brought out which works perfectly in the cupola if handled properly, and may be regarded as a distinct advance in the art. There are two methods now in use. That of L. Weiss uses a binder of "limewater," which must strike us as odd considering the infinitesimal quantity of lime actually getting into the briquette. In the other process, that of Arpad Ronay, heavy pressure gradually applied to remove the air contained in the borings is used without any binder whatever.

The questions arise whether these briquettes go to pieces in the cupola, whether they melt in the proper zone or above it, and if so—by reason of an open structure—whether they absorb sulphur there, recourse must be had to practical results. Mr. Messerschmidt maintains that the actual melting in the cupola is not a gradual occurrence but exceedingly rapid; in fact, as soon as a sufficiently high temperature has destroyed the power of chemical combination the metal melts instantaneously. This he states he has proved for the cupola, the iron in the melting zone taking up all ascending heat within 0.3 second when the cupola is in good working condition. Since the briquettes are not masses of metal chemically combined, but only particles mechanically pressed together, they should melt in detail considerably above the normal position of the melting zone, and hence the briquette must go to pieces before getting into the hottest fire. On the other hand, the loss in graphite on the part of the borings is quite marked, for in machining castings the mechanically mixed flakes of graphite in the metal are loosened and to some extent blown away. This will have some effect on the melting as well as on the subsequent character of the castings. Where a large percentage of briquettes is used the sulphur goes up considerably, and also to some extent the phosphorous, the latter by concentration. The reduction in the total carbon by the use of the borings briquettes means the production of castings without using the so-called "quality" pig irons which are very high priced. This would not affect American conditions, as softness is paid for here rather than the stiff, hard, but eminently strong classes of work. The high sulphur question is, however, a serious one, and when castings run over 0.10 they cannot stand changes in temperature as readily as they should. Sulphur is apt to cause unsound spots, strains and shrinkages. Neutralizing this bad effect by adding steel turnings in the briquettes will help overcome the difficulty.

The two processes in question, by using about 35,000 lb. per sq. in. pressure, make briquettes of so dense a character that they retain their shape in the cupola perfectly and do not absorb as much sulphur as where lighter pressures are used. Investigations by the Royal Testing Bureau of Prussia have shown that the binder employed by Weiss is of so trivial a character that it might as well have been left out and hence the two systems are to some extent nearly identical. Hence also the patent war now going on in Germany in this connection.

The Chemistry of Cupola Practice

In regard to the sulphur absorption in the cupola an interesting test was made by Mr. Messerschmidt. He took a steel rod 1 in. in diameter and placed it in the center of the cupola when charging. After the heat was going and the lower portion of the rod could be thought melted off, the remnant was pulled up forcibly and analyses made of the surface for sulphur. For 40 in. above the point of melting off the sulphur began with 0.12 and went down to the original 0.02 per cent. of the rod. This would indicate the chances for contamination by sulphur. In the melting zone proper there is but little sulphur given up, for this is driven off and absorbed higher up.

As to the probable absorption of sulphur the following may be said: With sulphur in the coke at 1 per cent. and using the ratio 1 to 10 above the bed, the rise of the sulphur in the mixture will be 0.05 per cent. If the specific gravity of the briquettes should be taken as low as 5.0 and pig iron at 7.5, then the briquettes would be heated up proportionately sooner, and might be supposed to take up proportionately more of the sulphur, being in that atmosphere just so much longer. That is to say, the increase in the briquettes would be 0.075 per cent. instead of 0.05 per cent. As of course only a percentage of the heat is composed of briquettes this increase is not so very marked.

Mr. Messerschmidt scouts the idea of a manganese increase and cites tests of his own in which this was not the case. In one case the mixture running about 0.62 per cent. turned out castings with 0.48 per cent. manganese. The same tests also show that no silicon or manganese is oxidized until the briquette reaches the melting zone.

It is naturally an important point to keep the borings very clean, for if oil and waste be not kept out of them they may oxidize by spontaneous combustion, becoming red hot. The normal loss of the briquettes is about 6 per cent., but this refers to clean material. If cleanness is not watched the loss will creep up to 10 per cent. Regarding the cost of the processes the figures are hardly applicable to American conditions, and as they contain royalties they become still less so. When compared, however with the price of scrap, they show quite an advantage. Great stress is laid on the ability to cut out high priced irons, which also does not affect us, as we have advanced beyond the stage of dependence on special irons in our melting practice.

Borings Briquettes and Steel

Mr. Messerschmidt gives some interesting results with steel scrap additions in regular cupola practice, as contrasted with the use of briquettes. His results correspond with American practice in this regard and would indicate that the value of the briquette lies in the cheapening of the mixtures more particularly, inasmuch as quality can be obtained as well if not better by using steel in the mixture.

In trying to explain what actually happens when melting these briquettes, the author gives an interesting picture in which he reviews what has preceded, and lays great stress upon the sulphur absorption. This works antagonistic to the silicon, so that when the metal drops through the melting zone it will readily burn out. Unfortunately the theory is based upon but one experiment or two, and hence might be modified later when more experience is had. At any rate, he shows the importance of sound melting practice where good results are essential. In any case, he advises not to use more than 30 per cent. of these briquettes for the mixture and preferably less. His final suggestion, and a good one, is that sufficient lime be added to the briquettes in the making to counteract the sulphur absorption and thus take away the one uncomfortable feature of the otherwise excellent process.

R. M.

The Pioneer Iron & Steel Company, Kansas City, Mo., has been incorporated with $10,000 capital stock. The company acts as manufacturers' agent, and takes over the business which has been conducted under the same title for the past six years, with offices in the R. A. Long Building.

Castings from Nonferrous Alloys

Their Production for Service Involving High Pressures

At the last meeting of the Institute of Mechanical Engineers, held in London, in December, 1910, a paper was read on "The Production of Castings to Withstand High Pressures," by Prof. H. C. H. Carpenter and C. A. Edwards. It contained details of an investigation under the auspices of the council of the institution. The object of the investigation was the production from nonferrous alloys of castings capable of withstanding high pressures —hydraulic, steam or gaseous. The following synopsis of the paper is given by the London *Times Engineering Supplement:*

The alloys in current use fall into one of two main classes: 1. Gun metals, the principal constituents of which are copper and tin. 2. Complex brasses with copper and zinc. The former usually contain zinc, and may also contain lead and manganese; the latter include iron, manganese, tin, and in some cases aluminum among their minor constituents. "Manganese bronze," as applied to the latter class, is a misleading term, and "manganese brass" much more nearly represents the facts.

Difficulties from the Alloys, the Pattern and the Mold

The difficulties that had to be overcome in order to produce a casting that would stand the hydraulic test are summarized under three main heads:

1. Those liable to be caused by the metal or alloy—(*a*) Dross or scum, due to oxidation. (*b*) Piping, due to the shrinkage of the fluid metal. (*c*) Pin holes or sponginess, due to the trapping of gas set free on solidification among the crystals. (*d*) Heterogeneity, due to the segregation, under certain conditions, of particular constituents, and resulting in brittle and sometimes unsound patches in the alloy. (*e*) Stresses, set up in the solid alloy by the unequal contraction of its structural constituents, sometimes leading to microscopic fractures. (*f*) Deterioration, due to structural or molecular changes in the alloy with lapse of time, leading to the so-called "crystallization" of the material, and resultant weakness.

2. Those liable to be caused by the pattern—(*g*) Stresses, set up during cooling by abrupt changes in thickness of section, for example, at the junction of flange and body. (*h*) Planes of weakness, if not actual fracture, caused by the crystals growing in a particular direction, for example, in rectangular castings.

3. Those liable to be caused by the mold—(*i*) Blowholes, due to the mold being too hard, or too damp, or to the sand containing rust or scale.

Copper and Tin Alloy

The authors chose as the simplest case possible the casting of a cylinder in a chill mold. By doing this they reduced to a minimum the chance of encountering difficulties caused by the mold and the pattern, and were able to concentrate on the selection of a suitable alloy and the working out of the conditions of casting it. The mold, specially designed for the purpose, was made of gray cast iron. At the outset, experiments were made with a pure gun metal containing only copper and tin, in the proportions of 85 to 15. Metals of the highest commercial purity were used—electrolytic copper and Straits tin, containing 99.98 per cent. of the respective metals. The copper was melted under wood charcoal in a covered crucible. After the addition of tin, sufficient phosphorus, in the form of a copper phosphide, containing about 15 per cent. of phosphorus, was added so as to remove oxygen and leave not more than 0.1 per cent. of phosphorus in the cast alloy. After stirring well and skimming, the metal was poured. It was, of course, cast from the bottom. Under these conditions, the authors were able repeatedly to produce castings which were perfectly sound, and after being machined withstood, on an average, pressures of 18 tons before they burst. Previous to fracture there were no signs of leaking.

Aluminum Bronzes

Experiments with aluminum bronzes were then started. The first mixtures contained 91 per cent. of copper and the remainder aluminum, and were prepared by melting the copper in a covered crucible and adding the aluminum to the fluid copper. A considerable amount of dross formed under these conditions. It was removed as far as possible by stirring and skimming. The temperature of the melt was taken in the crucible by a thermo-junction and direct-reading pyrometer. Each mixture was poured at 1125 degrees C., which was about 80 degrees above its freezing point. With one exception, the castings thus obtained were quite satisfactory. Some of them contained signs of dross, but this appeared to be confined to the surface and did not affect the soundness of the material. After machining they were tested up to 12 to 13 tons. At about this pressure the casting stretched slightly and water was forced through the valve joint. It was possible to raise the pressure to 14 to 15 tons by tightening up the joint. After this the material stretched again, and the process had to be repeated. At 18 tons none of the four sound castings had fractured. The tests were stopped here. This 9 per cent. aluminum bronze thus proved itself capable of holding gun metal, with the difference that it showed greater ductility.

Six casts of the same composition were then made in green sand molds. The metal was poured from the bottom and a large riser used. Three castings did not even pass the preliminary test. The remaining three appeared satisfactory and were then tested under higher pressures. The pressure was raised to 10 tons, when the joint opened, releasing the pressure. After tightening, it was raised to 13 tons, when it stretched again. By alternately stretching the casting and tightening the valve joint the pressure was ultimately raised to 19 tons. After this the walls of the cylinder were machined down to ⅜ in. thickness over two-thirds of its length, and the pressure was taken up by stages to 18 tons without fracture. At this stage the walls had bulged so much that the outside of the cylinder had the appearance of a stressed test piece of the alloy. By the next day the recorded pressure had fallen to 16 tons. The wall thickness was then reduced to ¼ in., and the cylinder again tested. It passed through a similar series of tests and remained unbroken at the end. No doubt if this treatment had been sufficiently prolonged, the cylinder could have been fractured, but this would only have taken place after the hardening produced by the water pressure had raised the yield stress to the same figure as the ultimate stress. These tests showed that it is possible to cast cylinders of aluminum bronze both in chill and sand molds, which are not burst by water pressures of 18 tons per square inch. Their only drawback was that they began stretching at pressures of 10 to 12 tons, the sand castings giving the lower figure, as might have been expected.

A bronze containing 9.5 per cent. of aluminum was cast and tested. It stood up to 11 tons pressure before bulging, and then behaved similarly to the 9 per cent. bronze. A 10 per cent. bronze was cast. This was tested up to 12.5 tons before expanding. By alternately tightening the valve joint and exerting pressure, 18 tons were recorded. Next a 10.5 per cent. bronze was cast. This stood up to 14 tons before the joint had to be tightened, after which 18 tons pressure was obtained; the wall thickness was reduced to ⅜ in., and on retesting the cylinder burst at 17 tons pressure. Finally an 11 per cent. aluminum bronze was cast. This withstood hydraulic pressure extremely well, and the pressure was taken up to 20 tons without any sign of leak. The wall thickness was reduced to ⅜ in., and on retesting, 18 tons was recorded before the cylinder burst.

Summary

In summarizing the paper the authors said that conditions were worked out under which nonferrous hydraulic castings, capable of withstanding pressures varying from 14 to 20 tons, can be produced. Castings of the same composition would be capable of holding gas pressures of 2000 to 3000 atmospheres at the ordinary temperature. Special tests of the suitability of this material for use as high pressure steam valves have also been made. These results were obtained by the use of pure

copper aluminum bronzes containing from 9 to 11 per cent. of aluminum, according to the size and shape of the casting, and permitting considerable latitude as regards the degree of "stiffness" required. The largest casting experimented with weighed 36 lb., including the gate and riser. The most suitable compositions for these are the bronzes containing from 9 to 10 per cent. of aluminum. Higher percentages can be successfully employed only with small castings.

The following precautions have been found essential: (1) The alloy must be poured very slowly; (2) it should be cast at a temperature of not more than 50 to 80 degrees C. above that at which freezing begins; (3) the gate should be so arranged that the metal enters the mold at the lowest possible point. Broadly speaking, almost any form of gate will do, but it has been found advantageous to provide a sort of well at the bottom and to use rather a narrow opening; (4) in the case of green sand molds, care must be taken that the sand is not too damp, particularly in the lower parts where the metal rests on it. If a rather close sand is used it is far safer to dry the surface of the lower part of the mold; (5) in large castings the use of risers is essential to overcome the shrinkage of the alloy. If these conditions are observed, after sufficient practice, castings can be regularly made absolutely free from dross and nearly always sound. The average is not less than four clean, sound castings out of six. They appear to be perfectly satisfactory with regard to homogeneity, and their corrodibility is extremely slight, whether in fresh or sea water.

So far as the authors are aware this combination of properties is unequaled by any other bronzes, and they recommend their trial in cases where chronic difficulties are encountered with the use of gun metals, manganese bronzes, &c. In particular, the metal must be poured as quietly as possible, and every care taken to prevent it from being agitated, after it has entered the mold. In this way the dross is kept down to a minimum. Any departure from this principle means the laying up of trouble. The characteristic property of these molten bronzes of forming a tenacious film of alumina the moment a fresh metallic surface is exposed to the air, this film being irremovable by any deoxidizer or combination of fluxes, is really the key to the situation. It appeared originally as an enemy, and for a long time remained so. Such success as the authors have achieved is due to their having converted it into a friend, by utilizing its tenacity to protect the remainder of the fluid metal from oxidation.

The Results of Iron Molders' Strikes in 1910

A summary is given by the *Review* of the National Founders' Association for December, of the results of strikes of union molders in 1910, in foundries in the United States and Canada—all strikes in which the molders' union gave financial support to the molders and coremakers:

Foundries affected	137
Union members involved	3,626
Foundries involved in compromises	15
Union members involved in compromises	665
Foundries involved where strikes have been lost to union	104
Union members involved where strikes have been lost to union	2,556
Foundries involved where union has been successful	18
Union members involved where union has been successful	405
Foundries involved where strike benefits are still being paid	83
Union members involved where benefits are still being paid	2,175

In 101 of the 137 foundries involved, the strikes were begun in 1910; in 35 in 1909 (including 11 shops in Denver, Colo.), and in one in 1908. The largest number of molders who went on strike in one city was 350, in Troy, N. Y., where in most of the shops the disputes were compromised.

The J. W. Paxson Company, Philadelphia, Pa., manufacturer of foundry supplies, &c., has taken an interest in the Kiamensi Clay Company, Newport, Del., and in the future will sell its product, consisting of ground, lump and prepared fire clays, fire mortar and kaolin, also steel molding sand, strong and coarse silica sands Shipments can be made in bulk or bags by either rail or water routes.

The Newark Foundrymen's Association

Members of the Newark Foundrymen's Association, Newark, N. J., at a meeting January 4, listened to an address on "Employers' Liability for Accidents," by A. Parker Nevin, counsel for the National Association of Manufacturers. The speaker was introduced by Franklin Phillips of the Hewes & Phillips Iron Works, and president of the Foundrymen's Association, who explained that the subject was of immediate interest to the members, as a commission recently appointed by the Governor of New Jersey is considering the recommendation of an employers' liability law, fashioned along the lines of the Wainwright act now in operation in the State of New York. Mr. Phillips, who is also a member of a committee appointed by the Newark Board of Trade to offer recommendations to the commission, said that New Jersey manufacturers in general favor certain modifications to the law in force in New York, and explained further that under the New Jersey statutes the common law governing acts brought against employers for liability for action could not be abrogated.

Mr. Nevin gave an interesting outline of the compensation acts now in force in Germany and Great Britain, and stated that under our form of government they could not be practically applied. He reviewed the Wainwright act and declared that it had many points unfavorable to the employers. The speaker concluded by stating that the question has as yet been unsolved to the satisfaction of either the employer or employee. Mr. Phillips explained that the New Jersey commission intends making a canvass among manufacturers in that State in order to ascertain their views on the question of employers' liability, and that the association had decided to act as a body in replying to the list of questions to be contained in the commission's circular inquiry.

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its regular monthly meeting at the Manufacturers' Club, in that city, on the evening of January 4, with President Thomas Devlin in the chair. The Committee on Arrangements for the trip to Boston, Mass., to attend the annual dinner of the New England Foundrymen's Association, reported that a special car would be provided and that a delegation of about 25 members of the association would attend.

The election of officers was held, with J. S. Hibbs acting as temporary chairman. There being no further nominations beyond those reported by the Nominating Committee, the following were unanimously elected to serve during 1911: President, Thomas Devlin, Thomas Devlin Mfg. Company; vice-president, E. E. Brown, E. E. Brown & Co.; treasurer, Josiah Thompson, J. Thompson Company; secretary, Howard Evans, J. W. Paxson Company; Executive Committee: Walter Wood, Thomas M. Eynon, H. L. Haldeman, Walter T. MacDonald, W. H. Bickley; official chemist, George C. Davis.

The paper for the evening's discussion was on "Machine Molding vs. Hand Molding," by John Alexander of the Harrison Safety Boiler Works, Philadelphia. A lengthy discussion followed, in which opinions as to the character of sand used, shape of flasks, methods of barring, and other details of foundry practice were brought out. A vote of thanks was extended to Mr. Alexander for his interesting paper.

The Pittsburgh Foundrymen's Association.—The monthly meeting of the Pittsburgh Foundrymen's Association was held in Engineers' Hall, Oliver Building, on the evening of January 9. A paper entitled "Micro-Structure of Cast Iron" was read by Albert Kingsbury, consulting engineer, and was illustrated by lantern slides.

The J. S. McCormick Company, foundry supplies, Pittsburgh and Mauch Chunk, Pa., has opened an office in the city of Milwaukee, Wis., in charge of Joseph Harrison, a well-known foundryman. The office is located at 318 Walker street.

Experience with Molding Machines*

Adaptations of the Various Types and Details of Performance in Foundries Operating 717 Machines

BY JOHN ALEXANDER, PHILADELPHIA.

As far back as 51 years we have an instance of foundrymen using a double squeezer in making railroad chairs and bells for lines that were laid through the African deserts. Again, 46 years ago, we read of a machine being invented for making gear wheels, hand methods not being considered accurate enough. Five years later (1869) a patent was granted on a jarring machine, and from that time the general progress on molding machines was very slow until about 10 years ago, when the still increasing demands called for a greater production. It gave a new impetus to the molding machine, and has led to the production of many machines for a greater range of work. I believe that if molders had been taught in the beginning how the machines were going to take most of the laborious work off them, so that they could look after the art, machines would have been further advanced to-day than they are. Some features of the trade which the majority, skilled and unskilled, don't seem to try, and do not thoroughly realize the machine, kinds and qualities of sands and where and how they should be used; mixtures of facings, where and how to apply them; how to nail and where to secure sand pockets; how to rod and where to gagger or vent if necessary, and how to make partings; how to finish, to cut gates and to anchor cores if necessary to clamp and to pour off, and to temper and cut up heaps to suit various kinds of work.

Plain Power Ramming Machine

Let us now make a few comparisons of machine molding and hand molding. Take a plain power rammer. This type of machine, as its name implies, simply rams the mold, the pattern being drawn by hand with the assistance of a vibrator attached to the frame or plate on which the patterns are mounted, and "V" pins, acting as a guide, which insures the pattern being drawn on a straight line. At a certain brass foundry in Syracuse, N. Y., the operator on this kind of a machine (a molder) was making 195 molds, 10 x 19 x 5 in. cope and 4-in. drag in 8 hours. By hand methods the best he could do, using the same pattern board or frame, and all other conditions equal, was 121 molds in 8 hours, and castings were not as uniform or satisfactory as those made on a machine; 1 per cent. of bad about equal. Again, at a malleable iron foundry in York, Pa., a man on this same kind of machine, was turning out 185 molds, 12 x 14 x 4 in. cope by 4-in. drag in 7 hours, while the best that could be done by hand ramming was 90 in 8 hours, all other conditions being equal.

The Split Pattern Machine with Power Ramming and Power Draft

These machines are especially suited to standard duplicate work, such as brass or iron valves, fittings, brake shoes, shaft hangers and boxes, and can be easily operated by skilled or unskilled help. At a foundry in York, Pa., a man was turning out on this machine from 100 to 118 of 14 x 16 x 4½ in. cope by 4½-in. drag in 7 hours. He shoveled and riddled his own sand, set cores and handled all molds himself, but got some help to pour off and shake out. The same man's best day's hand molding was 65 molds—other conditions the same. Then at a certain foundry within 10 miles of Philadelphia two men were making from 186 to 201 molds, 14 x 16 in., which contained two brake shoes, in 8½ hours, coring them and closing them; but, as the machine was kept working steadily, a separate gang was pouring them off in the afternoon. Hand molding on this job I wasn't able to get, but I guess most of us can think of the comparison.

Squeezer Machine

Machines which ram and vibrate the molds are commonly designated as "squeezers." After the operator has filled the flask with sand he rams or presses the sand into position; this is generally accomplished by a side lever, which is operated by the workman, all other operations being performed as in hand molding. I may say that I have seen 244 molds, 10 x 19 x 6 in. made in 8½ hours. Under the same conditions but without the machine the best that could be done was 139 molds in 8½ hours. The operator in both cases had his sand heap cut up for him, all ready for starting to mold at 7 o'clock. One of the great advantages the operator on the machine had was that the machine followed the sand heap, doing away with the heavy carrying out of flasks to the end of the floor, thus enabling him to pour off easily, as he wasn't so tired, while in working by hand method he was scarcely able to pour off his 139 molds.

Stripping Plate Machine

Some of these machines both ram and draw the pattern, either by hand, air or fluid pressure, while some draw the pattern down through the stripping plate, this operation being done by the movement of a lever on the side of the machine. For accuracy of castings and amount of work its performance cannot be half duplicated by hand methods.

Blow Ramming Machine

At a certain foundry within three miles of this building I saw this class of machines in operation, each being handled by one molder and two helpers. The castings they had made were, as on all machines, very creditable. They were such as cone pulleys, small lathe heads, parts for drill presses and slotting machines, brackets and small pedestals, and they were having such unprecedented success that they told me they could never go back again to hand methods, as it cost too much to make these castings the old way, apart from the extra finishing in the machine shop.

Hinged Roll-Over Machine with Up Draw

This is a machine for general all around work that I think is hard to beat, so long as you keep within the limits of it and the men who are operating it. We have jobs on a 22-in. machine that take flasks from 14 x 23 in., ranging in quite a number of sizes up to 23 x 39 x 5½ in. copes and 5-in. drags, 26 x 26 x 4½ in. drags by 5-in. copes and 23 x 26 x 5 in. copes by 9-in. drags, this machine being able to give us a 7-in. up draw or draft.

The hinged roll-over machine with down draw or draft is much the same as the up draw roll-over machine, except that the clamping device is attached on the machine and is much handier in a great number of cases than the spring clamps, only it confines you more to certain sizes of flasks in widths and depths of draw. From the former machines we have had from 35 per cent. to over 100 per cent. more than any day's work in hand molding we could get with A1 riggings from the same class of work, and about the same thing can be said of the other machine.

Power Hinged Roll-Over and Up Draw Machine

This machine is operated like the hand roll-over machine, but rolling over and drawing are done by air or fluid pressure, this being accomplished in a very few

* From a paper read before the Philadelphia Foundrymen's Association, January 4, 1911.

seconds, no matter whether your mold is 800 or 2000 lb. The whole operation is controlled by one small lever. We have flasks that are used on one of those 30-in. machines that range from 26 x 26 x 14 in. drag by 6-in. cope, 30-in. round flasks, and others varying in sizes up to 38 x 45 x 7½ in. drags and 6½-in. copes, and really we don't know how we could get along without it. We can safely say we run from 60 to 90 per cent. better on a great variety of our work than we did three years ago under the old hand method, and the castings were not so uniform and weighed considerably more.

Gravity Molding Machine

This has its own peculiarity of ramming a mold, and care has to be exercised in moving the cradle with flask and pattern in it, so that the wads of sand which fall by gravity will back against each other properly. I can't say very much about its practical efficiency, but four firms using it in and near Philadelphia say they are making out all right. I know two of them have installed their second machine. Being a later development in molding, and having its own special construction of flasks and so on, it may take a little while yet ere it comes to be recognized as the older machines are. Anyhow, users say they can produce from 40 to 60 per cent. more and better work by far than by hand methods.

Jarring Machine

The plain jarring machine is adapted to a broad field of work, although not universal, and there must be judgment and discrimination when patterns are being made, as the sand must flow chiefly vertically. For uniformity in ramming, I know of no machine or hand method that compares with it. The ramming is densest at the surface of the pattern where you want it, and decreases as you go away from the pattern, thus allowing a freer escape for the gases. I have seen molds of varying sizes, weighing from 400 to 15,000 lb, rammed in a few minutes, when it used to take a number of hours to do the same operation; and when patterns were drawn from the machine molds the molder found he had very little to do to soft spots, as well as very few bars to finger or patch; in fact, nothing as compared with hand ramming and the hard work attached to it. Then, again, this same machine can be used to play a considerable part in making of cores.

Combination jarring machines, which jar ram the mold, roll over, vibrate and then draw the pattern, have a great advantage over all the others where there is a multiplicity of work, and pay well on their investment where conditions warrant it. Another machine jar rams and then squeezes the mold, doing away with the sometimes necessary butt ramming before bottom board or plate is put on.

Shockless Jarring Machine

The term shockless applies only to the foundation or supports on which the machine stands. The jar ramming of the mold is done while the table or platen is descending, coming in contact with the ascending anvil in a suspended position, thus eliminating all shocks to the foundation. We need have no fear of any pulsating variation in floor load while operating it; in fact, no more than in the operation of a power squeezer. I believe one thing that had kept the jarring machines from coming more to the front was the cost for foundations to combat the floor shock or load.

Shockless Combination Jarring Machine

Machines that jar ram, roll over, vibrate and draw, and machines that jar ram and squeeze, other conditions being the same as in the regular "shockless," merit all the credit given to them, and when we see and hear of these machines doing 75 to 250 per cent. more work on green and dry sand molds or half molds up to 50,000 lb. than had been done by hand work, we realize their great importance. What it might cost to equip a machine to accomplish some of these results it is almost impossible to say, but for many classes of machines this is a minor consideration when compared with the output, the life of your patterns and flasks and the weight of metal you save.

Results from Machines

Some of the benefits of the molding machine may be stated in brief: Castings are much truer to pattern; they weigh less, and weights are more uniform. Castings being truer, require less finishing in machine shop. There is a greater output for cost entailed, therefore castings cost less per unit. Patterns last a considerably longer time.

I may say that in 39 of the foundries I have visited of late, I found a total of 717 molding machines in daily operation, handled by skilled molders and unskilled help, making an average of about 19 to each foundry. It may surprise some of you to know that in 16 foundries in Philadelphia there is an average of 11 per foundry. If mechanical engineers or designers of machinery would give a little more attention to the foundry and change or modify their designs, doing away with projecting brackets, lugs, journal shaft boxes and so on, and belt them on where practical, molding by machinery would make a wonderful advance in the next few years.

The Welsh Tin Plate Trade

Under the title, "Tin Plates and Tariffs," the London *Economist* of December 24 prints the following interesting article relative to the status of the Welsh tin plate trade:

The rise in the exports of British tin plates during the present year has been one among many important signs of reviving trade. For the 11 months to November our exports from South Wales have amounted to 445,000 tons, compared with 402,600 tons in the corresponding period a year ago, and 370,000 tons in 1908, and it is hardly to be doubted that the home market has shown a similar tendency. This expansion has caused the erection of new mills with a capacity of 110,000 tons per annum—a fact which is very significant when it is remembered that practically no new mills have been erected since 1893, owners having hitherto been content to reopen the mills which had been closed owing to the McKinley tariff and the enormous overproduction in Wales in 1889.

For the last 10 years production has been unusually steady in this country, but the building of some 60 new mills in the present and coming year is a sign of great confidence in the future of the trade. It is a fact which has attracted considerable attention that exports to the United States have increased by over 11,000 tons this year, but *The Iron Age* of New York hastens to damp any enthusiasm our producers might be tempted to feel on this score by pointing out the unusual nature of the demand and by encouraging American makers to recover the drawback trade, which is all that remains to English exporters.

The foreign purchaser of canned American goods has been free from the incidence of the tin plate tariff, while the home trade has had to pay the higher prices maintained by the tariff. Past experience suggests that if the canning industries continue to insist on cheap material to safeguard their export trade, the Welsh makers will easily hold their own in this branch. But in any case there are large openings elsewhere for our manufacturers. The use of tin cans for motor spirit all over the world is largely responsible for the anticipated boom, while the general extension of the use of the material is evidenced by the widespread market which has grown up in recent years. Our exports to-day show the following comparison with 20 years ago:

	1889. Tons.	1909. Tons.
To the United States	336,692	64,475
To other countries	93,931	435,336

Whatever may have been the case in the past, it is evident that the tin plate trade to-day is no longer at the mercy of the tariff makers of the United States.

At the annual meeting of the Diebold Safe & Lock Company, Canton, Ohio, January 2, E. G. Bockius retired from the office of secretary-treasurer. John Rundt was elected secretary and F. G. Baehrens was made treasurer.

November Exports and Imports of Iron and Steel

According to the report of the Bureau of Statistics of the Department of Commerce and Labor, a considerable increase occurred in both exports and imports of iron and steel in November, as compared with October. The value of the November exports of iron and steel and manufactures thereof, not including iron ore, was $18,593,806, against $17,452,085 in October. The value of similar imports in November was $3,329,919, against $2,497,754 in October.

The November exports of commodities for which quantities are given, show a very heavy increase, being much greater than for any previous month in the year. The figures for each month of last year, up to November, are given in the following table:

Months.	Gross tons.	Months.	Gross tons.
January	119,091	July	128,055
February	110,224	August	134,996
March	124,753	September	109,378
April	117,918	October	129,322
May	135,344	November	154,723
June	120,596		

Details of the exports of such commodities for November and for the 11 months ending with November, are as follows, compared with corresponding periods of the previous year:

Exports of Iron and Steel.

	November.		11 mos. ending Nov.,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	20,875	9,168	115,966	57,913
Scrap	2,555	820	21,109	24,957
Bar iron	949	628	16,483	12,287
Wire rods	1,857	3,362	21,293	17,780
Steel bars	9,682	7,631	99,324	67,101
Billets, blooms and plates	17,695	2,715	47,350	101,237
Steel rails	28,263	34,569	311,587	246,389
Iron sheets and plates	9,660	7,344	94,169	65,608
Steel sheets and plates	16,190	10,327	157,306	93,426
Tin and terne plates	2,455	740	11,402	8,197
Structural iron and steel	8,909	7,842	133,403	82,315
Barb wire	10,134	6,730	72,904	65,235
Wire	10,337	5,778	85,125	71,122
Cut nails	1,155	1,432	7,633	9,231
Wire nails	2,692	2,905	38,610	27,580
All other, including tacks	1,103	497	9,436	6,750
Pipe and fittings	10,212	13,028	142,480	145,374
Totals	154,723	115,516	1,385,580	1,102,502

The imports of commodities for which quantities are given were as follows for each month of the year up to Noyember:

Months.	Gross tons.	Months.	Gross tons.
January	58,308	July	42,326
February	44,519	August	36,878
March	57,150	September	30,960
April	51,438	October	31,454
May	45,021	November	40,584
June	31,010		

The details of the imports of such commodities for November and for the 11 months ending with November are as follows, compared with the corresponding periods of the previous year:

Imports of Iron and Steel.

	November.		11 mos. ending Nov.,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	20,427	34,707	217,322	147,835
Scrap	1,293	15,902	70,143	41,424
Bar iron	2,846	2,554	35,726	16,541
Billets, bars and steel forms n.e.s	5,677	1,030	44,784	14,400
Sheets and plates	299	898	5,967	3,955
Tin and terne plates	8,059	8,047	63,530	57,398
Wire rods	1,983	439	18,924	9,953
Totals	40,584	63,577	456,396	291,506

The imports of iron ore in November were 197,833 gross tons, against 219,571 tons in October. The total importations of iron ore for the 11 months ending with November were 2,417,321 gross tons, against 1,472,348 tons in the corresponding period of the previous year and 652,559 tons in the corresponding period of 1908. Of the November imports of iron ore, 97,206 tons came from Cuba, 31,145 tons from Sweden, 25,041 tons from Canada, 21,889 tons from Spain, and 22,552 tons from other countries.

The total value of the exports of iron and steel and the manufactures thereof, not including ore, for the 11 months ending with November, was $182,970,193, against $142,605,148 in the corresponding period of the previous year. Similar imports were respectively $36,267,671 and $27,079,199.

Canadian Iron and Steel Works Extensions

President J. H. Plummer of the Dominion Steel Corporation, Sydney, N. S., has contributed to the Toronto *Globe* a review of conditions in the iron industry of Canada. He says that the consumption of iron and steel in Canada is growing rapidly, and that while plants have made large extensions these will scarcely overtake the demand. In the past year the reaction in the United States has affected the Canadian steel market. With reasonable tariff conditions, Mr. Plummer thinks the iron industry of Canada should grow until it holds relatively as important a position as that of the United States. He considers that the bounties on iron and steel, which were first paid in 1902 and are now terminated, were merely the diversion to the steel plants of the revenue they themselves created. He estimates the expenditures in developing iron and steel and related industries in Canada from 1887 to 1910 as follows: Construction and extension of iron and steel plants, $35,146,000; acquisition and development of iron mines (in Canada and Newfoundland), $5,302,000; acquisition and development of coal properties directly connected with iron and steel plants, $18,500,000. These figures relate only to manufacturers of pig iron and steel, and do not take in rolling mill and other industrial operations in which the production of the larger companies is used as raw material. Summarizing the recent new construction at important iron and steel plants in Canada, Mr. Plummer gives the following:

"In the East the Dominion Iron & Steel Company is just completing a large block of coke ovens and a new blast furnace, while contracts have been entered into for still another furnace, both being of the standard size adopted at the plant, with a capacity of 250 to 300 tons daily. The steel end of the plant is being reinforced by two open hearth furnaces so large as to represent as great a capacity as the 10 existing furnaces, so that the company can, if necessary, double its present production of open hearth steel. A new merchant and rod mill is also under way.

"The Nova Scotia Steel Company has devoted its attention chiefly to 'balancing' its plant, for which purpose two large finishing mills were erected in New Glasgow during the year. It, too, has put in low pressure turbines to utilize exhaust steam, and it has done a large amount of equipment and development work at its mines in Wabana.

"In the West equal activity is seen. The iron and steel plant at Sault Ste. Marie is being greatly enlarged. A blast furnace of 450 tons capacity has been built, and will be blown in next month. By-product coke ovens are in process of erection, which will supply the blast furnaces with coke made from slack coal brought by water from Lake Erie ports, an addition which will round up the property in a department which is essential to its economical and profitable operation. The company is also building two merchant mills, in which structural material, bar steel, &c., will be rolled, and it is also installing a large gas engine power plant of 17,600 hp. in the aggregate. Its mines, furnaces and mills have all been run steadily and successfully during the year, and its output in rails shows an increase in the year of over 30,000 tons, the total being 218,655 tons.

"The Canada Iron Corporation has put up a new blast furnace at Midland, which is now in operation."

Coal shipments from the port of Buffalo for the season of 1910 were 3,629,368 tons, a gain of 586,662 tons over 1909.

The Garrison 400-Ton Double Acting Press

A 400-ton drawing press for very heavy work, which is a radical departure in this line of machinery, has recently been built by the A. Garrison Foundry Company, Pittsburgh, Pa. Fig. 1 is a front view of the press, while Fig. 2 shows the opposite or rear side. The press is a very heavy tool weighing about 175,000 lb., and is adapted for such work as can be handled on a bottom platen, the area of which ranges from 48 x 64½ in. to 54 x 64½ in.

The novel feature of the press is the mechanism by which the blank holding device is operated. This consists of a pair of mutilated gears, which engage in and are driven by two racks connected to a frame, that in turn is actuated by means of a pitman and crank, the latter being keyed to the main shaft. These mutilated gears have an arm cast in one piece with the gear wheel. When the blank holder is down this arm bears against an adjustable face on the rack frame and is held in that position by a latch, which slides upward and over the face of the arm, as the rack frame rises and the racks leave the teeth of the gears. One merit of this particular form of construction is that the blank holder has an unusually large movement. In this particular machine the lift of the blank holder is 20 in., while the stroke of the ram is 28 in. This permits a longer interval and more room for the insertion of the blank. The main advantage, however, is that on account of the construction the dwell of the blank holder is absolute (levers are not thrown on their centers as is usual); not only does all action cease, but the crank shafts which lift the blank holder are held rigidly, being clamped in a vertical position by the latch and arm, as shown in Fig. 1. By reason of this construction the length of the dwell of the blank holder

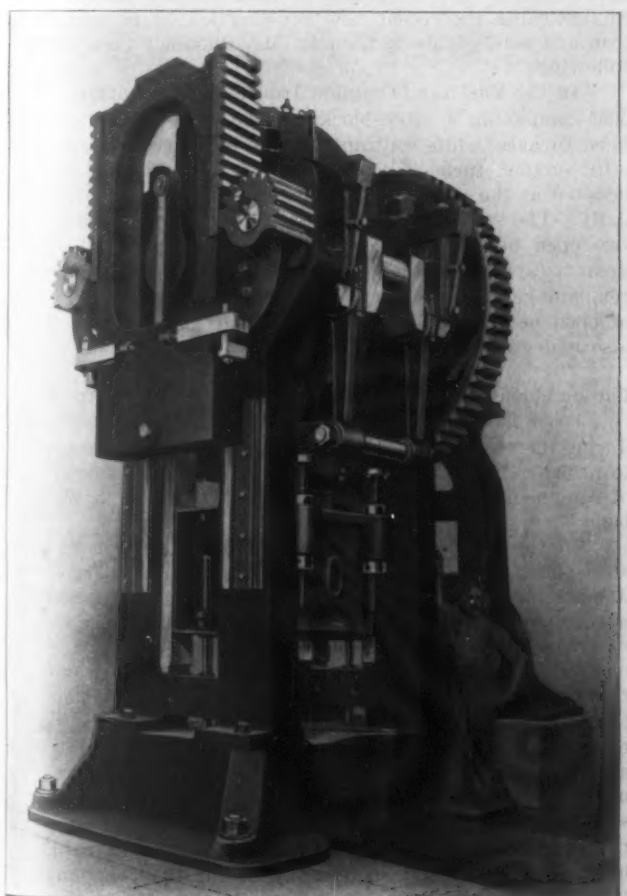


Fig. 1.—Front View of a Large Drawing Press Built by the A. Garrison Foundry Company, Pittsburgh, Pa.

is independent of the stroke of the ram, and cannot only be made any desirable fraction of the cycle of operation, but also the length of the cranks may be varied and the hight of the blank holder may be changed correspondingly.

In the drawing presses now in general use the knockout is usually operated by a lever and rod connecting one of the blank operating shafts with a lever operating under the bed of the machine. In this machine the blank holder itself carries two rods, which pass down through the frames, as is shown in the engravings, and these rods in turn carry a cross arm, through which the

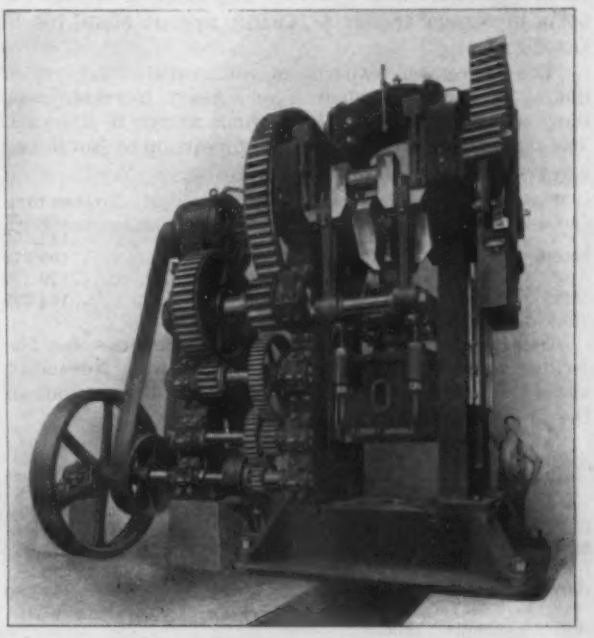


Fig. 2.—Rear View of a 400-Ton Double Acting Press, Showing Drive.

knockout bar passes, being supported at the bottom by a steadiment in the foundation, and at the top by passing through a bushing in the bed plate.

This arrangement for ejecting the blanks is said to have at least four times the mechanical efficiency of the usual appliance, and is of marked advantage where the work is heavy and where blanks of unusual thickness have to be forced upward through large dies. The stroke of the knockout rod is adjustable from 20 in. down to as little as desired. For convenience the raising and lowering of the ram is effected by a small motor located on the ram and the power of a 100-hp. motor is all utilized in driving this machine when doing its heaviest work. The machine is rated most conservatively and the factor of safety is large. This will be noted in the size of the main shaft, which is of nickel steel 14½ in. in diameter.

A Country Club for Employees.—The United Shoe Machinery Athletic Association has formally opened its new Country Club, the gift of the employing corporation, the United Shoe Machinery Company, Beverly, Mass. The building is a handsome structure, containing 14,000 sq. ft. of floor space, with lounging room, writing rooms, a well-stocked library room, billiard room with four tables, card room, a hall seating 450 persons with a stage for theatricals, and the usual conveniences of locker rooms and baths. The house is adjacent to a large athletic field, and is on a river, where boating will be enjoyed. While in the country the property is not distant from the works.

A Private Accident-Relief System.—The Morgan Construction Company, Worcester, Mass., has adopted a workmen's compensation system known as the Industrial Accident-Relief for Employees. The system is modeled on that of the American Steel & Wire Company, varying in a few essential details. The period after an accident where no relief is paid is shortened to five days, as compared with the 10 days of the American Steel & Wire Company, and the maximum amount of relief that shall be paid to married men is placed at $2.50 per day instead of $2.

The Columbia Steel Foundry

Details of a Recently Opened Pacific Coast Open Hearth Steel Castings Plant

In the Eastern section of the country the starting up of one more steel foundry is not a very important event. On the Pacific Coast, however, quite the reverse is the case. Recently the Columbia Steel Company, with the main office at 503 Market street, San Francisco, Cal., which heretofore has been operating a converter plant at Portland, Ore., started its new basic open hearth plant at Black Diamond, Cal., a small town at the head of San Francisco Bay. The equipment of the foundry and its arrangement are thoroughly modern, as is shown in the partial plan reproduced in Fig. 1.

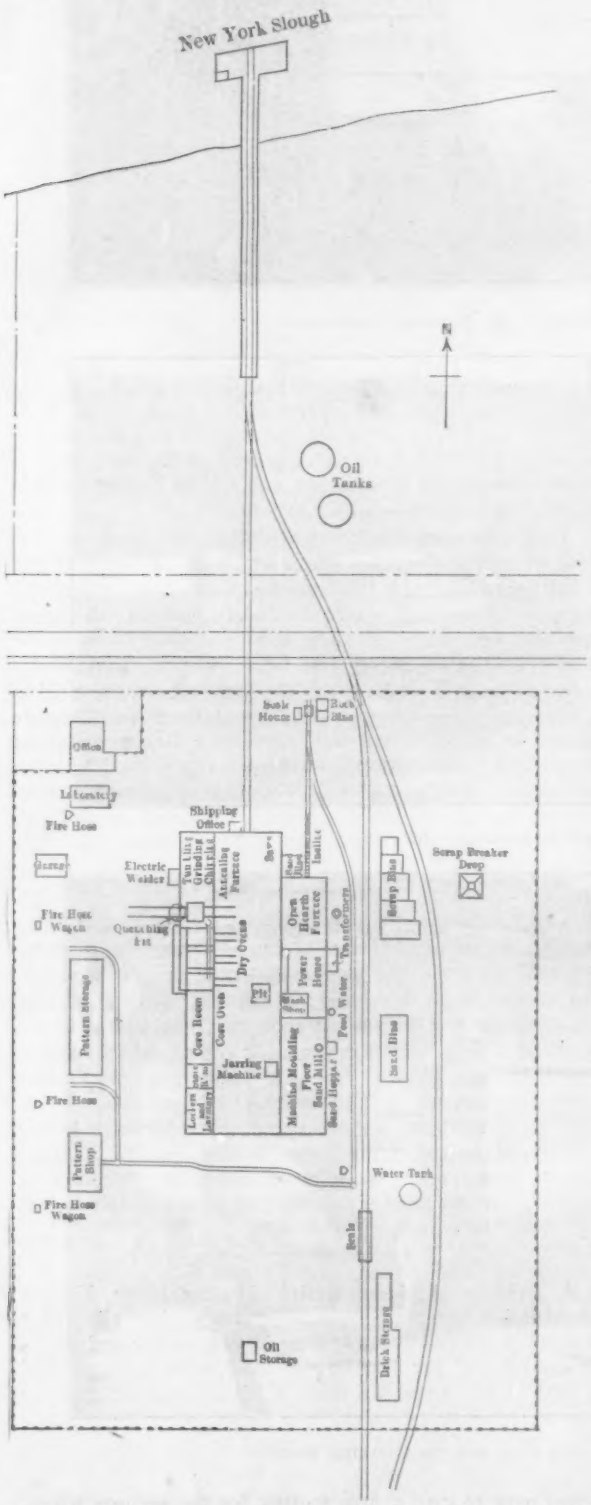


Fig. 1.—Plan Showing Location of Buildings and Tracks at the Foundry of the Columbia Steel Company, Black Diamond, Cal.

The property owned by the company comprises 20 acres, having a water frontage of 800 ft., and railroad connections with the Southern Pacific and the Santa Fé systems, and also direct boat service to San Francisco, Stockton, Sacramento and intervening points on the San Joaquin River. On account of the advantageous location it is possible to make quick deliveries to points on the tidewater and in the great valleys of California.

The Buildings

The buildings consist of the main foundry, which is a steel structure throughout, 130 ft. wide by 260 ft. long, with a craneway extending through the end of the building, permitting the transfer of flasks, castings, &c., with the least possible amount of handling. The walls of this building are largely composed of glass so that the entire shop is practically as light as out doors.

The pattern shop is a brick building, 30 x 50 ft., with trussed roof and lighted on all four sides with spacious windows. Next to this is the pattern storage building, a two-story brick structure, 30 ft. wide by 100 ft. long, which is arranged with a system of shelving for storing patterns so that any desired one may be located readily by simply referring to the pattern index.

The laboratory is another brick building which is subdivided into a chemical department, a weighing department and a testing machine department. This is a very complete and well arranged laboratory, and in it minute records are kept of the chemical and physical properties of the steel turned out in each heat. The office building is located close by, and is subdivided into a general office and separate rooms for the officials and various departments.

General Plant Equipment

A dock is built about the middle of the water front, and standard gauge tracks run from the yards to this dock for the transfer of material coming or going by water. A pipe line extends from this dock to the oil tanks, as the fuel used throughout the plant is oil, and the most economical way of handling it is by pumping it from the oil vessel to the large storage tanks located near the water front. A line running from these tanks to the power house supplies the pumps furnishing the burners of the boiler, open hearth furnaces, ovens, &c., with fuel.

A modern locomotive crane of 10 tons capacity serves the yard for transferring cars, loading castings and unloading pig iron, scrap and other raw material by a powerful magnet. This crane is also fitted with a grab bucket for unloading cars of sand, limestone, fluorspar and other supplies.

For fire protection this plant is probably as well equipped as any. A large underwriters' pump, located in the power house, pumps direct from the river through 6-in. mains surrounding the entire plant. In addition to this a reserve tank containing 50,000 gal. of water is located close to the main building on a steel tower 70 ft. high.

The Foundry

The equipment of the foundry proper, an interior view of which is given in Fig. 2, is all very modern. The bay is 60 ft. wide and a 30-ton crane, as well as two 10-ton auxiliaries, travel its entire length and out into the yard. The whole arrangement of the shop is such that the molding is done at one end, and when the molds are made they are carried to the drying ovens, which are shown in Fig. 3. After drying they are immediately placed in front of the open hearth furnace where they are poured. As soon as the castings are broken out of the molds, they continue on their way to the cleaning department. After being cleaned they go

to the shipping department and out of the building to rail or boat, as the case may be.

The furnace which is shown in Fig. 5 is of the open hearth basic type, and was designed by S. T. Wellman, the company's consulting engineer. Although nominally rated at 15 tons, this furnace is capable of melting 25 tons at a single heat. It is served by a high frame charging machine, running the full length of the charging floor, which is built entirely of 12-in. channels riveted together with the flanges resting on the I-beams of the floor construction, while the web forms a smooth floor. Immediately in front of the charging doors the steel is bricked over to give a firm footing for the melters when shoveling or rabbling. Fig. 4 shows the furnace, the charging floor and the charging machine.

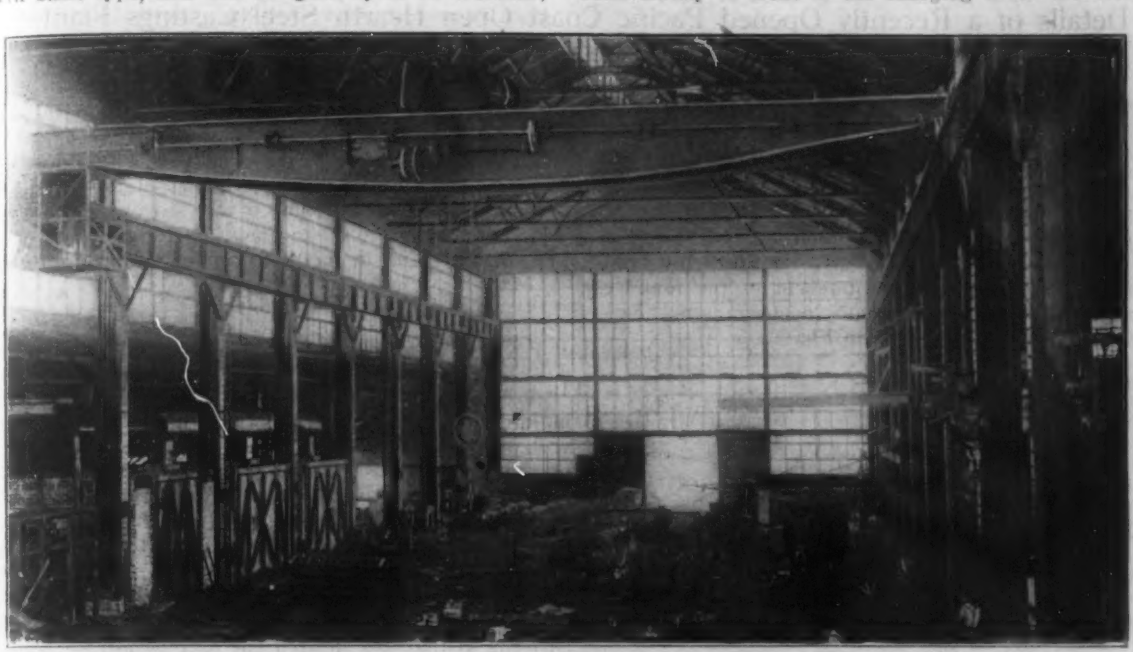


Fig. 2.—Interior of the Foundry Looking Toward the Cleaning Department.

Fig. 3.—View of the Drying and Annealing Ovens.

Fig. 4.—View Showing the Furnaces, the Charging Floor and the Charging Machine.

The molding floor occupies the southern half of the

building; next is the drying oven department and the pouring floor, and finally the chipping department where the castings are prepared for shipment. Jib cranes swing-

Fig. 5.—The Open Hearth Furnaces as Seen from the Pouring Floor.

ing from every other column throughout the length of the shop as well as the traveling cranes serve the shop so efficiently that delays in handling are reduced to a minimum. Modern pneumatic molding machines and core machines complete the floor equipment.

The annealing department is also an interesting feature of this plant, as it is arranged not only for handling mild steel castings but also manganese steel with a special peel machine, which takes the castings out of the annealing furnace and transfers them while hot to the tempering department for subsequent treatment.

The cleaning department is equipped with direct connected electric driven grinders, swing grinders, cold saws and draw shapers. There is also a sand blast room set apart from the main cleaning department with a car running into it from the main shop, so as to reduce handling to a minimum.

Electricity is used as power for driving the numerous cranes and tools. This is purchased on a long time contract from one of the large power companies who generate alternating current at a potential of 60,000 volts back in the mountains and transmit it to the Coast, where it is stepped down to 4400 volts at substations for local distribution. At the plant of the Columbia Company the current is again stepped down in the ratio of 10 to 1, and is distributed at 440 volts about the plant for operating the cranes and the motor driven tools or for furnishing power to air compressors or hydraulic presses.

A Cleveland Portable Pneumatic Grinder

A portable pneumatic emery grinder and castings cleaner, known as Style A, is a new product of the Cleveland Pneumatic Tool Company, Cleveland, Ohio. Fig. 1, is an exterior view of the grinder, and Fig. 2 a sectional view.

The grinder has two pairs of pistons working at right angles. At opposite ends of the main cylinder casing and in direct alignment are two handles, one surrounding the emery wheel arbor and the other, rotatable, controlling the throttle. By this manner of handling, the machine is practically balanced, and is considered to be more

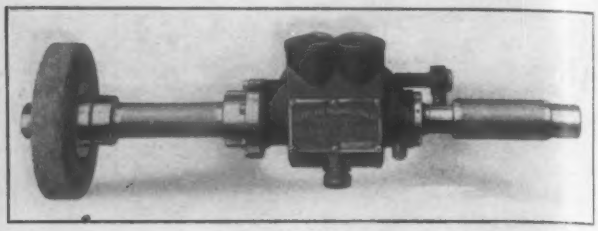


Fig. 1.—The Style A Portable Emery Grinder Made by the Cleveland Pneumatic Tool Company, Cleveland, Ohio.

convenient for the operator than if the handles were at right angles to each other. Twisting the throttle handle to right or left starts or stops the machine. The emery wheel arbor has ball bearings, and is connected by a key directly to the main crank shaft.

The four pistons of the motor are single acting, and are connected in pairs to opposed throws of a double crank shaft. The end bearings of the crank shaft serve also as valves and run in bronze bushings; one controls the supply and the other the exhaust to the various cylinders. The connecting rods and crank are drop forged. The rods are each in one piece, an especially strong construction, and the piston end is in the form of a ball, which allows universal motion in the piston itself. In the piston any wear of the connecting rod may be taken up.

The main body of the machine is a one-piece steel casting, provided with hand hole openings, which are not shown in Fig. 2, to allow of quick access to the crank chamber and the connecting rods for making repairs.

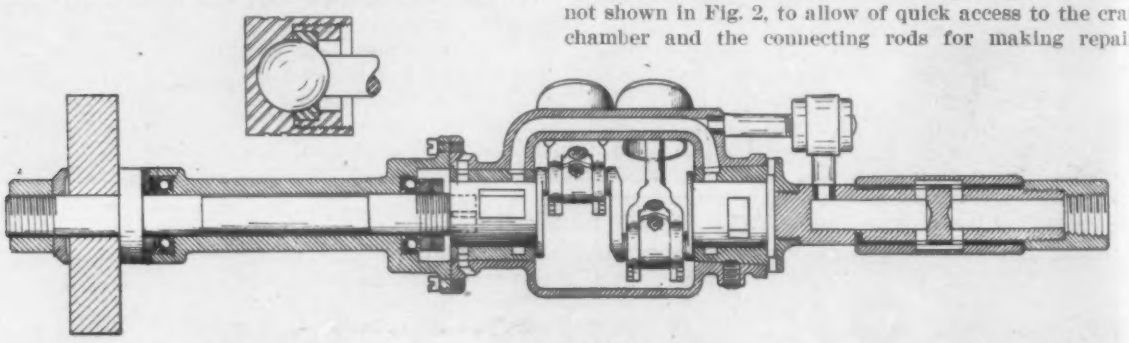


Fig. 2.—Axial Section of the Cleveland Portable Pneumatic Grinder and Detail of the Piston and Rod Connection.

By having the crank trunnions act as valves the number of parts is considerably decreased, making the machine simpler and allowing the placing of the throttle handle and emery wheel arbor in alignment.

The Cleveland grinder will drive up to a 6-in. emery wheel with a 1¼-in. face. It is adapted to grinding off fins and risers from iron and steel castings, trimming weld seams and countersunk rivets or uneven edges of steel plate in structural or ornamental iron work. By locking it in a vise it becomes a grinder for edging small tools. A multiple disk scaling wheel can be used in place of an emery wheel for removing rust or scale from iron or steel. Disk plates can be quickly removed by unscrewing the nut from the hub of the wheel and disks replaced when worn out. A wire wheel brush can be used for cleaning castings and for removing blistered paint from metal and wood surfaces, and a felt wheel can be used for buffing and polishing bright metal surfaces.

The Hercules Steel Company, Portland, Ore., recently incorporated with $100,000 capital stock, states that its plans are not fully matured.

The New Standard Reducing Presses

The new line of reducing presses built by the Standard Machinery Company, 7 Beverly street, Providence, R. I., consists of three sizes. These are known as the No. 4-R, the No. 7-R and the No. 9-R respectively. The

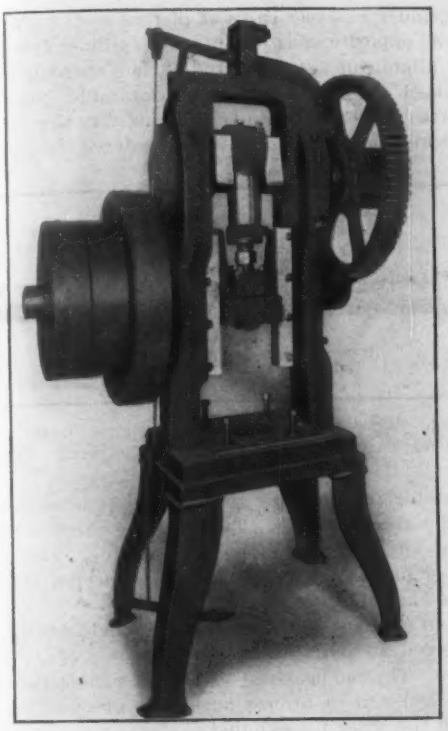


Fig. 1.—The No. 4-R Reducing Press Built by the Standard Machinery Company, Providence, R. I.

two former presses are of the general design shown in Fig. 1, while the other, which is a heavier machine, is shown in Fig. 2. These presses are used for drawing, broaching and reducing metal, and the largest size is particularly adapted for the manufacture of seamless tubing of brass, gold, silver and other metals, and can also be used for making sockets, large shells and other sheet metal work requiring drawing. The construction of all the machines is heavy and powerful.

The smallest size, the No. 4-R, has a single train of gears and is built either with or without back gears, while the No. 7-R is back geared, with single train. Both of these presses have a balance wheel and a tight and loose pulley drive. The No. 9-R has a double train of cut gearing, with a balance wheel and Hill friction clutch. Where extreme sensitiveness is required in the depression of the treadle a compound lever arrangement is furnished, a mechanism often necessary in drawing tubes or sockets with a shoulder and in broaching operations where an intermittent stroke is employed. The machines may be equipped with dial feeds, giving them a capacity of feeding two holes at each revolution, or with an automatic cam knock out for sheet work.

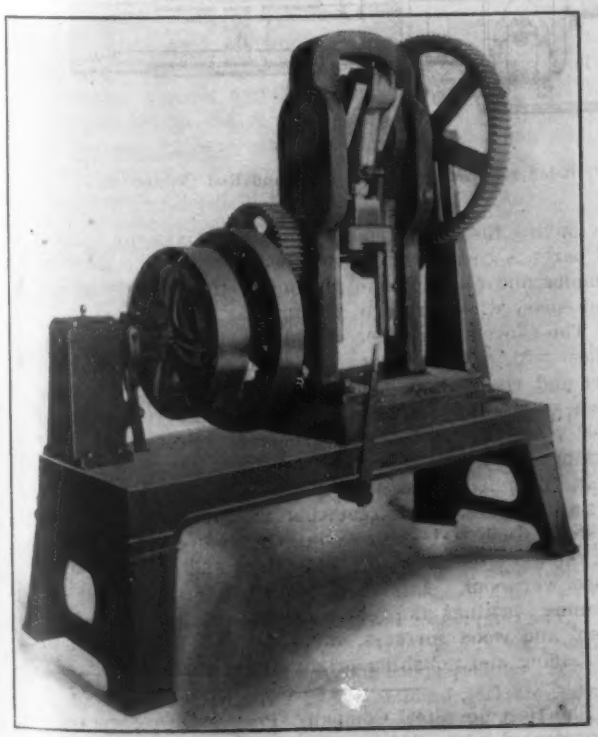


Fig. 2.—The Heaviest Machine of the New Line.

The machines have extra long ways, slides with long bearings and ball and socket connections. The crankshaft is of extra heavy drop forged steel, fitted with the company's adjustable wedge on the clutch side. The special type of brake, employed on the largest machine, is operated by a bell crank lever motion in connection with the shipper and treadle handle, which throws in the clutch. The driving power is taken direct on the clutch and pulley so that the balance wheel is without a belt. All back gear bearings are fitted with cap boxes and are babbited.

The following table gives the principal dimensions and specifications of the three presses:

	No. 4-R.	No. 7-R.	No. 9-R.
Minimum stroke of slide, inches	6	10	14
Maximum stroke of slide, inches	12	17	18
Adjustment of slide, inches	4	4	4
Distance between uprights, inches	19	19	19
Size of bottom of slide, inches	10 x 7	12 x 8	13 x 8
Gear ratio	5 to 1	9 to 1	24½ to 1
Diameter of flywheel, inches	34	36	36
Face width of flywheel, inches	5	5¼	5¼
Weight of flywheel, pounds	500	700	700
Diameter of tight and loose pulleys, in.	24	24	..
Face width of tight and loose pulleys, inches	5⅛	5⅛	..
Diameter of clutch pulley, inches	..	..	30
Face width of clutch pulley, inches	..	..	7
Overall hight, inches	90	102	108
Floor space, inches	64 x 42	67 x 50	96 x 45
Net weight of press, pounds	4,300	6,800	10,500

The equipment regularly furnished with these presses includes all the accessories ordinarily supplied with a tool of this character.

Steel Corporation Payments for Hill Ore

It was announced last week that the payment about to be made by the United States Corporation in royalties in iron ore mined from the Hill, or Great Northern, properties on the Mesaba range will amount to $2,856,000, representing 3,000,000 tons at 95.2 cents royalty. This statement is not exact, as the royalty stated is for the base Hill ore, an ore containing 59 per cent. iron. Variations from this content will mean either additions to or subtractions from the base rate. The contract made in 1906 calls for a payment of $1.65 per ton for the ore delivered at Lake Superior dock. Of this, 80 cents represents the freight rate. The royalty of 85 cents on the ore increases 3.4 cents each year. There have been three increments since 1907. Referring to the work done by the Steel Corporation on the Hill properties, Dwight E. Woodbridge writes in the *Engineering and Mining Journal* as follows:

"Work of the year in the Mesaba region has been unproductive of good ore, and what has been found is mostly in small deposits. The so-called 'Hill deal,' made between the United States Steel Corporation and the Great Northern Railway, in 1907, has been unsatisfactory to the lesee company, so far as known, in that the tonnage developed in addition to that shown prior to the execution of the lease is less than anticipated. Royalty rates on this ore, for the base of 59 per cent. iron, will be 98.6 cents a ton in 1911, and the minimum tonnage that the Steel Corporation will be compelled to turn over to the Great Northern road will amount to 3,750,000 tons this year and 4,500,000 tons in 1912. In order to deliver so much to the road the Oliver Iron Mining Company has been busy opening and developing mines on Hill lands, and now has several of them already shipping or about ready for the coming season of navigation. In order to care for the ore from other mines with which it has hauling contracts and this Oliver ore, the Great Northern will add to its dock and track facilities during the winter."

The Roberts Motor Air Compressor

A Light Compact Outfit for Portable and Stationary Use

A light portable outfit suitable for supplying air for all purposes for which it is ordinarily required is being built by the Roberts Motor Company, Sandusky, Ohio. The special features of the lastest type are a gear driven mechanical oiler, which starts and stops simultaneously with the operation of the motor, a rigid timer which it is said will not get loose and a noiseless carbureter. Figs. 1 and 2 show the oiling and carbureter sides of the compressor, respectively, while Fig. 3 is a view showing it mounted on a truck for use by contractors and for other service where a portable machine is required.

In building this compressor the intake valve has been eliminated, and ports in the wall of the cylinder through which the air is drawn have been substituted. These ports are uncovered by the piston at the end of the downward stroke. These machines are of the two-stage type, which enables them to pump to pressures of 200 lb. per square inch without loss of time, while at the same time they are said require less power to operate than a single-stage compressor. If an air compressor is to operate efficiently the air must be cooled in its passage from the low to the high pressure cylinder, and the latter as well as the former must be cooled. Ordinarily the receiver or intercooler is more or less bulky, and is located at the side of the cylinder. In the Roberts compressor it is made in the shape of a horseshoe and contained in the water space surrounding the cylinder. Its shape is such that it nearly surrounds the high pressure cylinder, thus giving a large cooling surface and at the same time a large capacity. In this way the compressor is very compact, and the weight of an exterior intercooler which is generally excessive is avoided.

The valves are readily accessible for cleaning, as any one together with its spring can be removed by simply

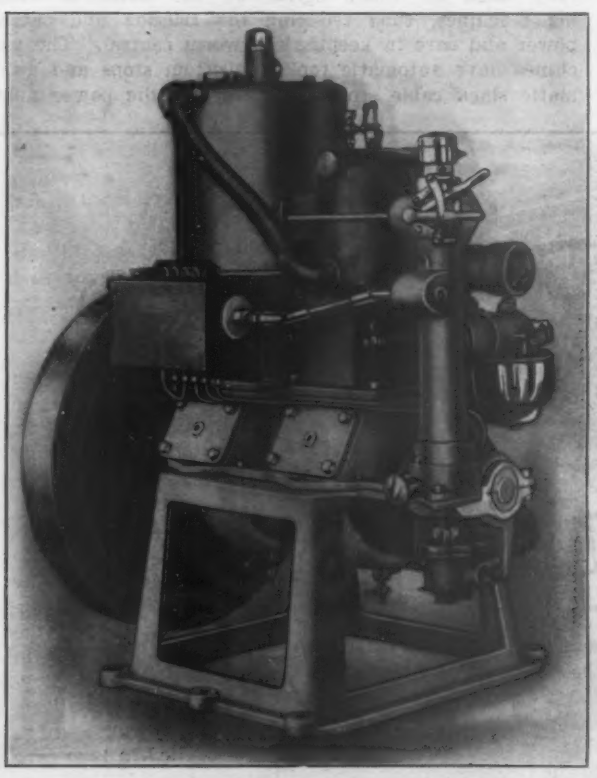


Fig. 1.—The Oiling Side of a New Air Compressor Built by the Roberts Motor Company, Sandusky, Ohio.

unscrewing one cap without in any way disturbing any other part of the compressor. The valve seats are also detachable since they form a part of the valve cage, which can be easily unscrewed after taking off the cap without disturbing any other part.

The compressor piston is double, the lower portion being the low pressure and the upper the high pressure. On its downward stroke all the valves are closed, and a vacuum is produced in the low pressure cylinder. Just before the piston reaches the bottom of its stroke the air inlet ports in the cylinder wall are uncovered and the air

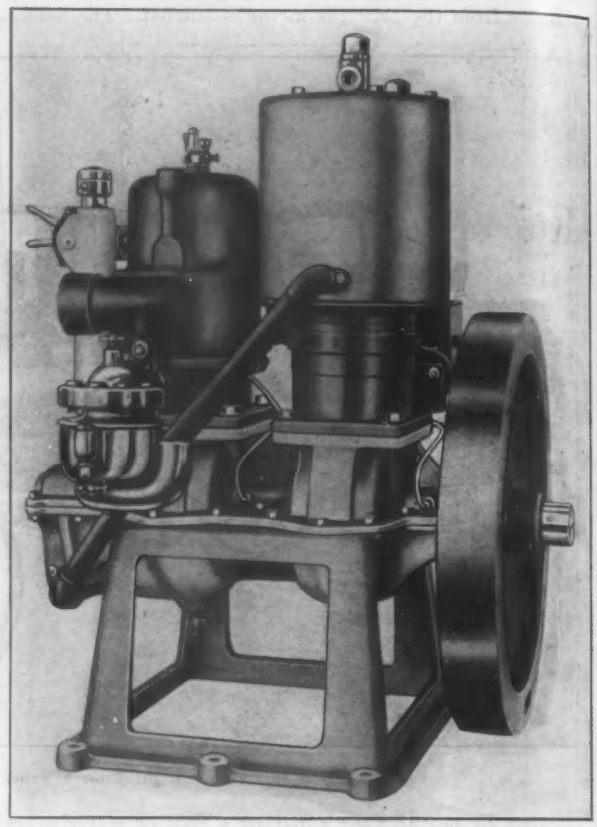


Fig. 2.—The Carbureter Side of the Compressor.

rushes in to fill the cylinder. The up stroke serves to compress the air and drive it into the intercooler from which it is drawn into the high pressure cylinder. The water jacket is held in place by one set of studs and nuts at the top, and can be readily removed by unscrewing the water connection and removing the nuts from the six studs that hold it in place without disturbing any part of the valve except the connection to the high pressure outlet. Removing a hand hole cover gives access to the connecting rod bolt for making adjustments.

The engine supplying power to the compressor is of the valveless two-cycle automobile type. The cylinder is carefully ground to size, and the crank shaft is of 0.4 per cent. carbon steel. All the bearing surfaces are ground to size, and the bearings are of die cast nickel bronze which can be readily replaced in case of wear. The piston pin is of case hardened and ground low carbon steel and turns in a phosphor bronze bushing. The motor has jump spark ignition and a helical gear drives the timer as well as the pump which furnishes a supply of cooling water.

The following table gives the principal dimensions and specifications of the compressor:

Diameter of engine cylinder, inches	4½
Length of engine stroke, inches	5
Speed, revolutions per minute	600
Horsepower	6
Area low pressure cylinder, square inches	17.54
Area high pressure cylinder, square inches	6.21
Length of stroke, inches	5
Air consumption, cubic feet per minute	30
Length, inches	27½
Width, inches	19
Hight, inches	34½
Weight with iron base, pounds	400
Weight with aluminum base, pounds	350

The compressor is furnished complete with carbureter, timer, mecanical lubricator, gear driven pump for cooling water, muffler, spark plug and coil, dry battery, switch, wire, starting handles, set of wrenches, oil can and complete book of instructions.

The portable type of compressor illustrated in Fig.

3 was originally made for the use of contractors laying water pipe. It is capable of supplying two ordinary caulking hammers, and it is stated that when used in this way the capacity of each caulker is quadrupled. The heavy galvanized steel tank has a capacity of 8 cu. ft., and can be filled with air at 100 lb. pressure within 3 minutes from the time the motor is started. The heat is radiated by burlap kept moist by a pail of water every 2 or 3 hours. The gasoline tank furnished has a capacity of 6 gal., which is sufficient for a run of 10 hours. Metal wheels having a tread of 56 in. are used. The truck has an open platform with trussed sills to prevent warping and is also furnished with a tongue.

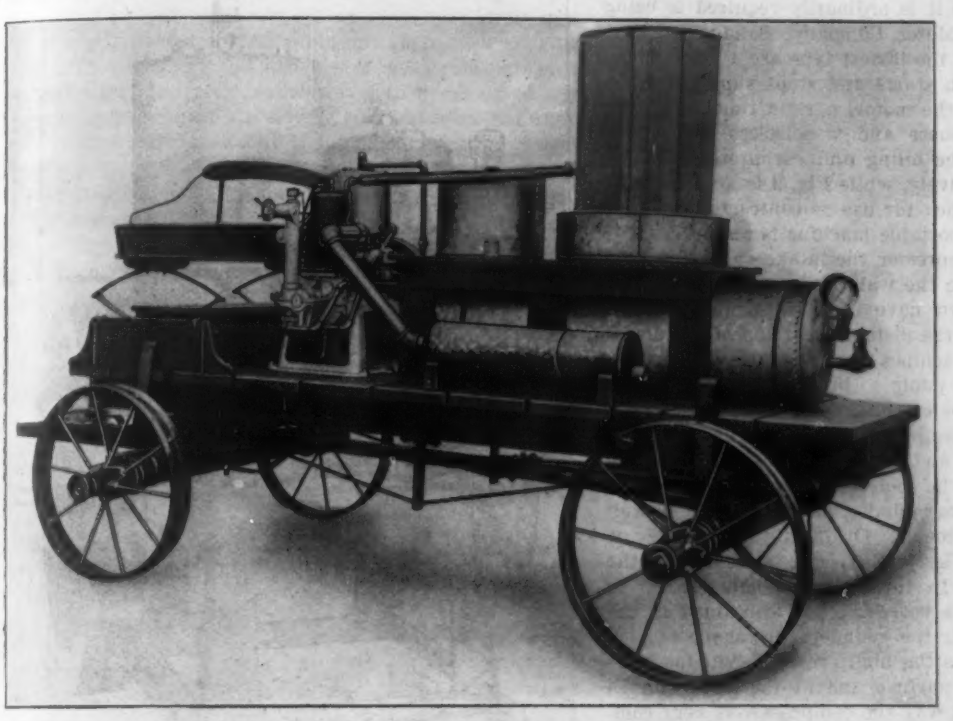


Fig. 3.—The Compressor Mounted on a Truck for Contractors' Use.

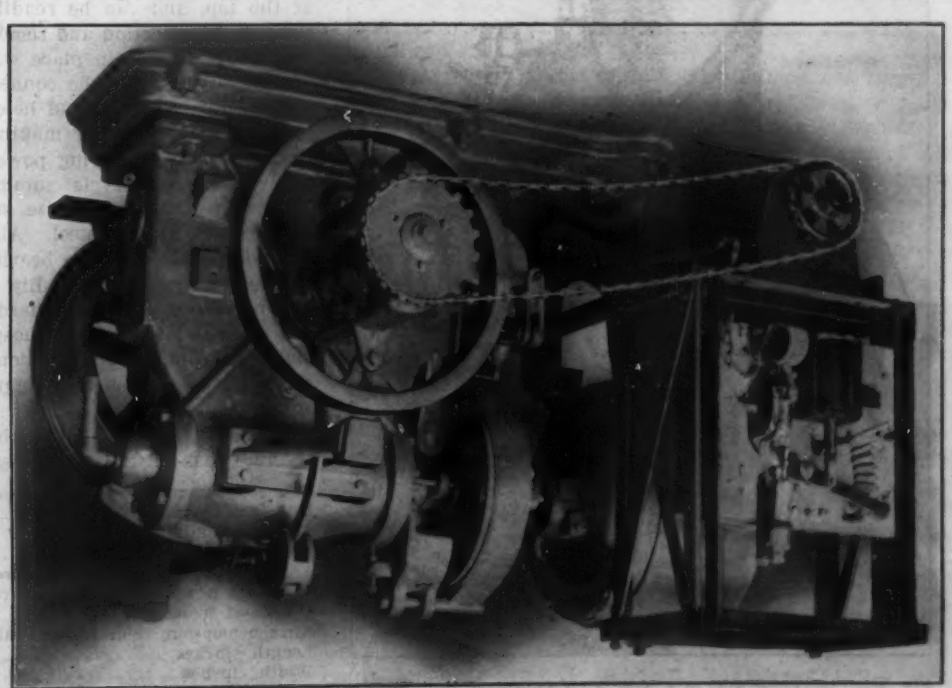
The equipment furnished for the portable type is the same as that for the stationary one with the following additions: Gasoline tank, burlap radiator, 200-lb. gauge, blow-off valves, air tank, two globe valves with hose connections and a tool box. The weight of the portable compressor complete is 1540 lb., and it can be readily moved from place to place by a single horse.

The output of the iron and steel works of the Dominion Steel Corporation in 1910 was as follows: Pig iron, 255,000 tons; steel ingots, 304,000 tons; steel blooms, 208,000 tons, steel billets, 88,000 tons; steel rails, 140,000 tons; wire rods, 79,000 tons. The Nova Scotia Steel & Coal Company made the following output: Pig iron, 66,000 tons; steel ingots, 75,000 tons; steel billets, 59,000 tons; bars and plate, 49,000 tons; axles, 34,000 tons. Both companies largely increased their production as compared with results accomplished in 1909.

Speidel Ceiling Electric Elevator Machine

A new type of direct connected electric ceiling elevator winding machine is being manufactured and placed on the market by J. G. Speidel, Reading, Pa. This machine is self-contained, the winding machine, motor, controller and reversing switch being mounted on a single heavy cast iron base, and is handled and put in position on the ceiling as one piece. This is an improvement over the old style, where each component part of the apparatus had to be suspended separately, an arrangement requiring considerable additional space, more labor and the constantly recurring difficulty of keeping the different parts tight and in alignment.

The winding machine proper is of strong and durable construction. The worm gear is of the Hindley type and is cut from solid blanks. The forged steel worm runs in a bath of oil, contained in a dust-proof casing. The end thrust is taken up on both ends by large hardened steel thrust bearings, which have heretofore been successfully used on other styles of the builder's winding machines, thus reducing the friction and saving power and care in keeping the worm central. The machines have automatic top and bottom stops and automatic slack cable stops that shut off the power automatically should the cable break or become slack from any obstruction to the car while descending.



The New Direct Connected Ceiling Electric Elevator Winding Machine Built by J. G. Speidel, Reading, Pa.

The motor is directly connected to the winding machine. The controller and reverse switch are attached to the side of the base plate and the motor. The reverse

switch is on top of the controller and is operated by an endless chain running over sprocket wheels from a shifting wheel on the drum shaft of the machine, which is operated by a cable extending through the various floors which the elevator serves.

The new machine is made in four different sizes, ranging from ½ to 3 tons capacity, and is sold as a separate machine to builders not manufacturing their own machines, or in connection with complete elevators built by the manufacturer.

The 16-In. Schellenbach Geared Head Lathe

A Semi-quick Change Gear Box Interchanging with Screw Cutting Attachment Is a Special Feature

The John B. Morris Machine Tool Company, Cincinnati, Ohio, is equipping its standard 18 and 20 in. lathes with the builder's semi-quick change gear box. Either the gear box or the quick change screw cutting attachment, with which it is interchangeable can be applied by the purchaser at any time after the machine leaves the factory if desired. Fig. 1 is a general view of the standard 16-in. lathe, with an 8-ft. bed, and Figs. 2 and 3 are an end elevation and sectional plan view respectively of the geared headstock.

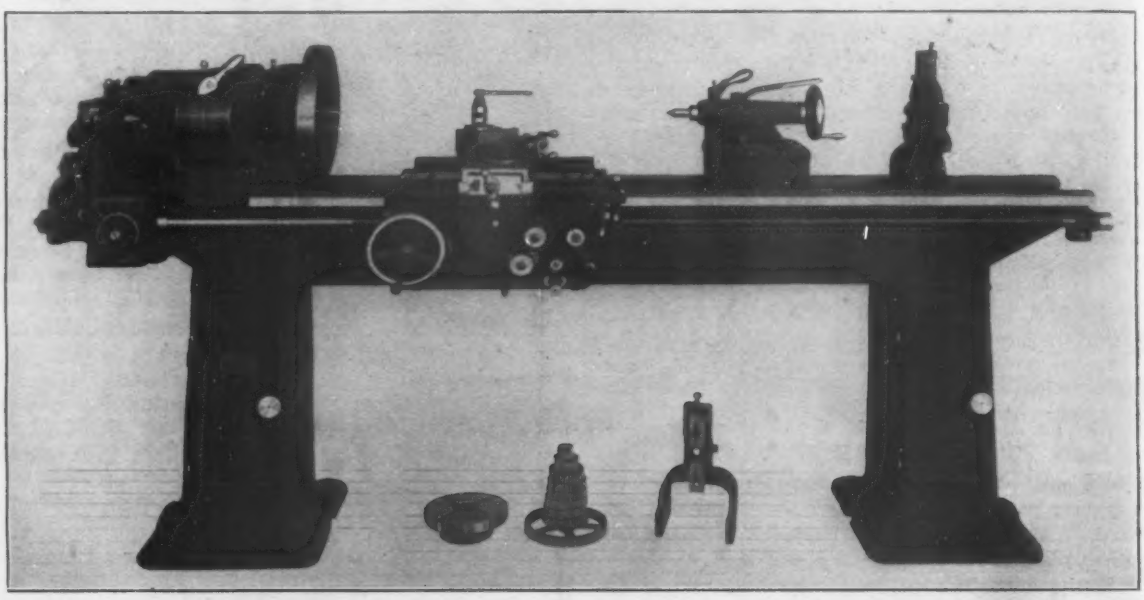


Fig. 1.—The Schellenbach 16-In. Lathe with an 8-Ft. Bed Made by the John B. Morris Machine Tool Company, Cincinnati, Ohio.

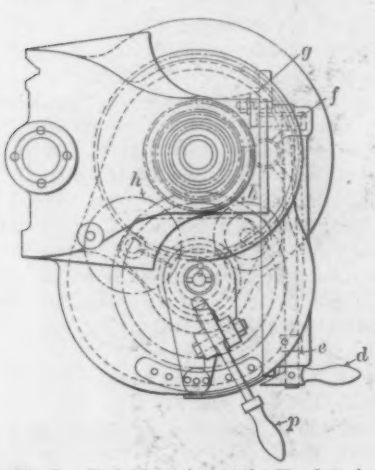


Fig. 2.—End Elevation of the Headstock.

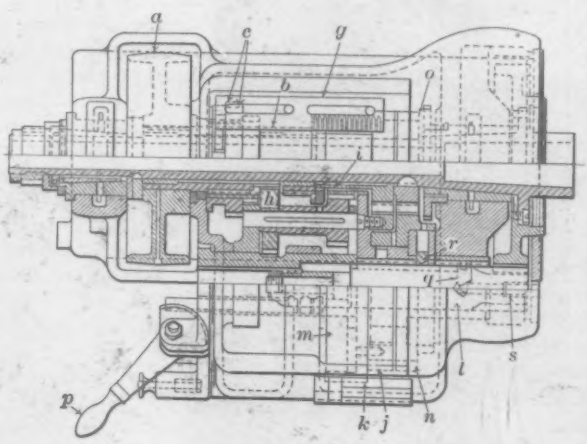


Fig. 3.—Sectional Plan View of the Geared Headstock.

Three changes of feed for every change of gears are provided by the gear box. The change gear quadrant is mounted upon and swings directly from the gear box, which permits this part to be manufactured as a separate and independent unit. The feed for the apron is through a splined screw and a steel sliding double bevel pinion, while both the cross and longitudinal feeds are driven through frictions and are reversible in the apron. The rack is used for the rough chasing of all screw pitches shown in the index as a positive feed is provided, thus relieving the lead screw of excessive wear. The rack pinion can be disengaged from the rack and also has an adjustment to compensate for wear. The carriage can be quickly locked to the bed for facing by the eccentric lever at the right of the apron. The chasing indicator, which is located at the right end of the carriage, is so made that its worm wheel can be disengaged from the threads in the lead screw when it is not in use. The apron and tailstock handwheels are counterbalanced and the steady rest can be faced in either direction.

Referring to the headstock, the construction of which is shown in Figs. 2 and 3, the driving pulley *a* is keyed to a bronze sleeve, which bears directly upon the lathe spindle, and also has a hardened pinion, *b*, keyed to it. The outside diameter of this pinion is the same as that of the bronze pulley sleeve. The hardened nickel steel cone gear *c* is splined to slide upon this bronze sleeve and the pinion, its longitudinal movement being controlled by the handle *d* on the shaft *e*, the sector *f* and the sliding fork *g*. The desired longitudinal position of this cone gear is determined by the pointer of the handle *d* and an index plate which gives a list of diameters to be turned at various cutting speeds in feet per minute, the diameters corresponding to the various gear combinations of the driving train. In Fig. 3 the cone gear is shown in its extreme left position, which exposes the pinion *b*, and allows the rocker gear *h* to mesh with it. Moving the cone gear to either of the two intermediate positions to the right brings the cone gears into proper alignment with the rocker gears *h*, the pinions of which mesh with the internal gear ring *m*. In the extreme right position the cone gear is clutched positively to the sleeve *i*, which revolves loosely upon the lathe spindle. The clutch teeth on this sleeve are formed to receive the teeth of the smallest gear of the cone *c* and the gear formed upon the sleeve meshes with the gear *j*, which is doweled and screwed to the flanged casting *k*. This casting is splined to the main driving pinion *l* and carries the in-

ternal gear ring *m*, previously mentioned. The flanged casting also drives the friction ring, shown in Fig. 3, which locks the gear *n* and the gear *j* by the longitudinal movement of the driving pinion *l* through the rack and lever *p* at the left of the headstock housing. The gear *n* meshes with the gear *o*, which is keyed to the spindle and has the same number of teeth as the loosely mounted gear *i*. The spindle will be driven at its maximum speed, which is that of the driving pulley, when the cone gear *c* is clutched to the gear *i* and the gears *j* and *n* are locked together by the friction. It will thus be seen that when the lever *p* is moved to the left the friction becomes disengaged and the pinion *l* slides upon and engages the steel face gear that is mounted on the outside of the front spindle bearing, thus giving a positive drive. The friction is operated by a dog or plug, *q*, in the pinion *l*, and this plug engages the lever *r* in the friction. The screw *s*, which can be adjusted from the front of the headstock, gives an adjustment for the friction.

When the cone gears *c* are disengaged from the clutch of the gear *i*, the rocker gears *h* can be engaged with a selected gear on the cone. The two rocker gears *h* and the manner of mounting them upon the rocker casting are clearly shown in Fig. 2. When the drive is through the cone gear *c* to either of the rocker gears, power is transmitted to the spindle either through the gears *n* and *o* or through the pinion *l* in the face gear. Fourteen changes of speed, all of which are available when the machine is running, can be obtained when the driving pulley is running at a constant speed. An oil bath is provided for the gears, none of which are loose and none exposed, and all of the gears which are thrown in and out of engagement are made of hardened nickel steel. If desired the lathe can be supplied with motor drive, in which case a bracket is mounted on the headstock and a gear substituted for the driving pulley. It is also possible for a silent chain drive to be used, the motor being mounted beneath the headstock.

Duff Ratchet Jacks at Panama

While several hundred jacks have been furnished to the Isthmian Canal Commission under contract for the construction for the Panama Canal probably the most important single shipment consisted of 276 ratchet jacks

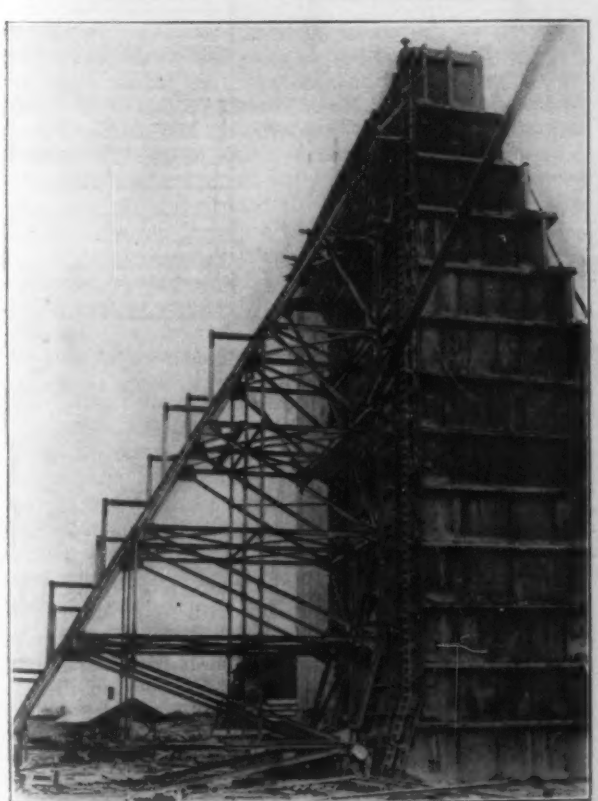


Fig. 1.—The Steel Plate Lock Form Which Is Lined Up by Ratchet Jacks Made by the Duff Mfg. Company, Pittsburgh, Pa.

Fig. 2.—Section of Frame and Plate Showing Jacks in Position.

of special construction, made by the Duff Mfg. Company, Pittsburgh, Pa. These jacks are being used in the construction work on the lock walls along the line of the canal, and were especially built for this work on an entirely new model. Fig. 1 shows the jacks in use for lining up the form for the lock walls, while Fig. 2 is a detail showing how the jacks are placed in position.

The jacks are of the double screw type, there being a right-hand screw on one side and a left-hand screw on the other with a ratchet between. They are used to line up and hold in position the large steel plate which serves as a form behind which the concrete dam sets. These plates are bolted to a huge A frame of structural steel, which is in the shape of a right angled triangle 78 ft. 4 in. high, 24 ft. wide and 40 ft. deep at the ground. As these jacks are tightened they spread the plate which is forced against the water side of the concrete dam. It is estimated that the pressure against each frame which is borne by the jacks is 1000 tons.

Twelve of these A frames are in use and operate on tracks so that they may be shifted from one section of a lock to another. The solid steel plate that is attached to each is as high and wide as the frame or traveler, and is placed on the inside where the concrete wall is to be constructed. As the concrete is set in the forms behind this steel plate, the jacks which are installed at the top and bottom and every horizontal member of the frame except the second from the top are tightened, thus forcing the traveler plate against the forms and lining up and holding in position the newly set concrete.

The aggregate weight of the shipment is over 23 tons and its total capacity 4500 tons. Two hundred and fifty-six of the jacks weighed 165 lb., and had a capacity of 15 tons, and the balance of the jacks each weighed 220 lb. and had a capacity of 30 tons. Three of these larger jacks are placed in the traveler near the ground where the pressure is the greatest, while 30 15-ton jacks are placed on the outside and center trusses of the traveler. In this way 8 of the 12 travelers can be operated with jacks at the same time.

The Aluminum Goods Mfg. Company, Manitowoc, Wis., has not decided on a location for its new plant, but expects to do so early in February.

Heating Furnace Doors

How a Modification in Their Design Stopped Air Leaks

BY FORDYCE W. BROWN, SPRINGFIELD, ILL.

In any furnace where the internal pressure exceeds the external, as in blast and malleable iron practice, the problem of securing an air tight fit on the charging door is an important one. To the writer was recently assigned the task of remedying several glaring faults in the design of a door attached to a large malleable iron furnace in the works of the Bradley Mfg. Company, Bradley, Ill., where he was employed. This particular furnace was fired at one end, the door being about a foot from the floor line.

The original design called for a door and casing, as shown in Fig. 1. The casing was of the ordinary pattern, except that the door *a* fitted down between the two projecting parts *b b* of the casing *c*. No provision was made for machining either the door or its seat on the casing. Two small projecting lugs on the door served to accommodate two 5-16-in. bolts, by which it was hung in place. The casing was bolted to the front plate of the furnace by three bolts on each side, as shown, the bolts being ½ in. in diameter. Both the door and casing were approximately ⅝ in. to ¾ in. thick, and the door was a plain surface.

On inquiry from the furnace men it was learned that it was impossible to prevent flames and gas from leaking around edges when blast was on, and consequently the door and casing were red hot most of the time during a heat. In addition to the excessive waste of coal, this caused the small hinge bolts to burn out every three or four days, filled the furnace room with smoke and gas to such an extent as to render it almost uninhabitable, and made the handling of the charging door decidedly uncomfortable. A hood was placed above the door to carry away the smoke and gas, but its work was of an indifferent sort.

Finally it was decided to put in a new door and casing and the one illustrated in Fig. 2 was designed. The casing *d* was made in the form shown, having a thickness from ⅞ in. to 1 in., and stock was left around the edges of the mouth for machining along the line *e f*.

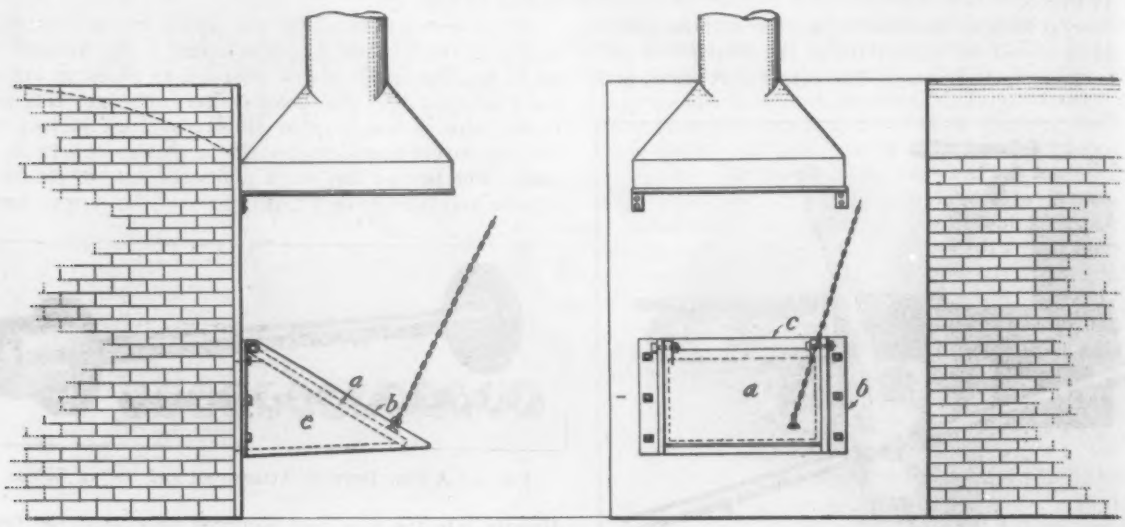


Fig. 1.—End and Front Elevations of the Original Door on a Heating Furnace at the Bradley Mfg. Company, Bradley, Ill.

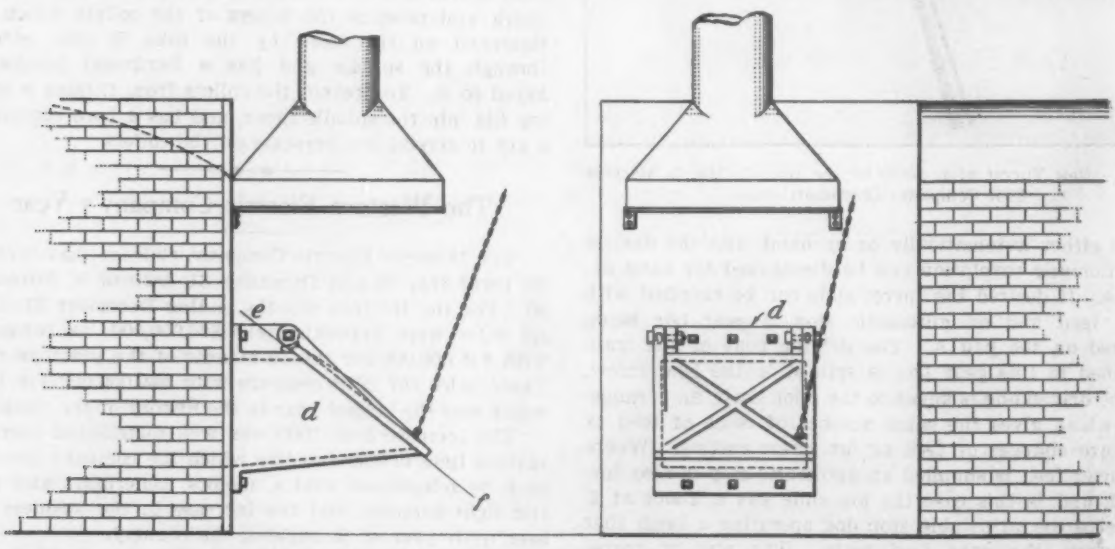


Fig. 2.—End and Front Elevations of a New Heating Furnace Door Designed by Fordyce W. Brown, Springfield, Ill.

The door was made 1 in. in thickness, braced with 7-16-in. diagonal ribs, as shown, and hung with ⅞-in. bolts. Stock was also left around the edges for machining. It also will be noticed from the drawing that the hinge bolts were located 7 in. from the front plate of furnace, and that the lugs for receiving same are cut under to clear fire door. The casing was bolted to the front plate by eight ¾-in. bolts, five in upper flange and three in lower. After the castings were made each was machined along the contact faces until a very close fit was produced, and after being clamped together holes for hinge bolts were drilled. The front plate of furnace was badly warped, and this necessitated considerable chipping and calking with fire clay when the casing was fitted to furnace, but after the door was hung and the blast turned on at the following heat it was found that a nearly perfect joint existed, there being no leakage noticeable. There also was no heating of the door, nor burning out of hinge bolts, and the discharge of smoke and gas into the fur-

nace room ceased. The foreman of the department since stated that from 400 to 500 lb. of coal less was used on each heat than formerly, which, when multiplied by two heats per day and 300 days per year, would amount to something in the course of a year.

New Morris Lathe Attachments

Three new lathe attachments have been developed by the John B. Morris Machine Tool Company, Cincinnati, Ohio, and are being regularly furnished as a part of the equipment of its engine lathes. These are the new turret slide shown in Fig. 1, the engine lathe turret illustrated in Fig. 2 and the draw-in attachment and spring collets shown in Fig. 3.

This turret slide is intended to be used without power feed, and is moved by hand through the pilot shaft and pinion in the customary way. The turret is revolved and

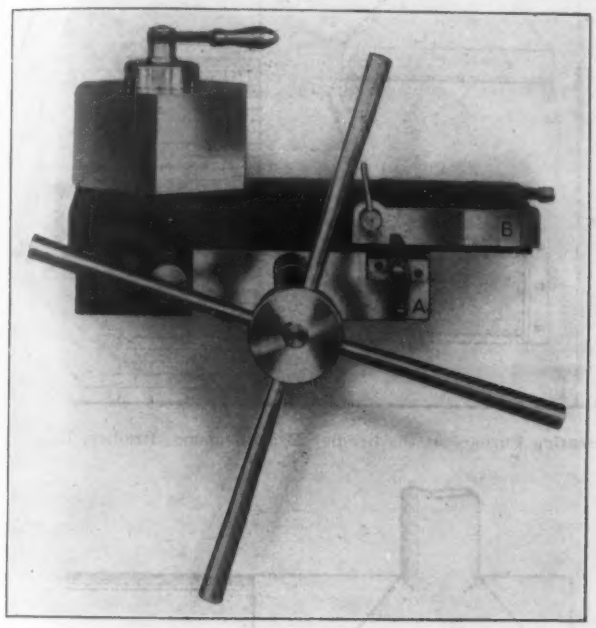


Fig. 1.—New Turret Slide Made by the John B. Morris Machine Tool Company, Cincinnati, Ohio.

locked either automatically or by hand, and the devices for automatic revolution can be disengaged for hand operation. If desired the turret slide can be supplied with power feed and an automatic stop, a gear box being mounted on the pad A. The driving gear of the train contained in this gear box is splined to the lead screw, and the driven one is keyed to the pilot shaft, an arrangement which gives the same number of rates of feed as there are changes of feed or for screw cutting. Where the power feed is supplied an automatic stop is also furnished, and in this case the top slide has a T-slot at B to receive the adjustable stop dog operating a latch that disconnects the gear feed train. The size of turret illustrated is for a 16-in. lathe and has a 12-in. traverse when operated by hand and one 3 in. less when revolved

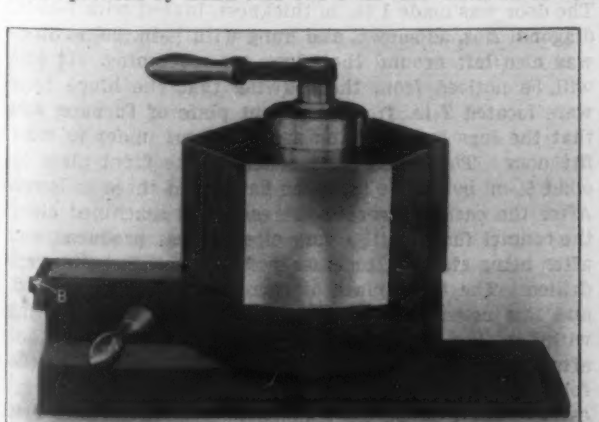


Fig. 2.—The Latest Type of Morris Engine Lathe Turret.

automatically. The hexagon measures 5 in. in hight and 9 in. across the flats, and will clear tools the diameters of which are not in excess of 5½ in.

The turret shown in Fig. 2 is intended to be applied to the carriage of engine lathes, and is made interchangeable with the compound rest. It contains a bronze nut for engaging the cross feed screw of the carriage, and has a bracket which can be bolted to the back of the carriage and acts as a positive stop for the turret by reason of the adjustable stop screw with which it is provided. The lock pin which is of hardened tool steel is controlled by the lever A and engages an index ring of the same material, the wear of the pin being taken up by a tapered gib which is adjusted by the screw B. This turret has the same hight and distance across the flats as that shown in Fig. 1.

The draw-in attachment and spring collets illustrated in Fig. 3 are intended for attachment to the maker's 14-in. lathe, although it can be supplied as an extra attachment on all sizes. The holes in the collets for this particular size of tool vary by sixteenths from ⅛ to 1 in., but the larger machines enable large size collets to be used. The bore of the chuck A fits the nose of the lathe spindle and threads on the periphery of the former screw

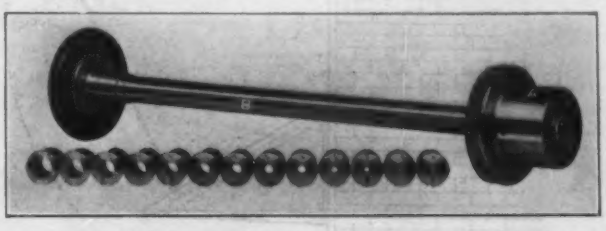


Fig. 3.—A New Draw-In Attachment and Spring Collets.

directly into the face gear mounted outside of the front spindle bearing. A ring of hardened and ground tool steel is forced into a counterbore in the front end of the chuck and receives the tapers of the collets which are tightened on the stock by the tube B that extends through the spindle and has a hardwood handwheel keyed to it. To prevent the collets from turning a bushing fits into the spindle taper, and has a bore containing a key to receive the keyseats on the collets.

The Western Electric Company's Year

The Western Electric Company, Chicago, has changed its fiscal year to end December 31, instead of November 30. For the thirteen months ending December 31, 1910, its sales were approximately $66,000,000, as compared with $45,000,000 for the 12 months of the previous year. These sales for 1910 compare with $69,000,000 for 1906, which was the largest year in the history of the company.

The increase over 1909 was well distributed over the various lines of merchandise which the company handles, such as telephones, cables, motors, generators and electric light supplies, and the increase in the business has been quite general throughout the country.

The Western Electric Company has some 20 houses located at various points in the United States, through which it distributes its electric manufactures and supplies. During the past year it has continued its policy of concentrating the manufacturing at Hawthorne, Ill., and several million of dollars have been spent there in new buildings. The latter part of 1910 more new buildings, to cost $1,000,000, were authorized, which will still further increase the capacity of the plant. The company now employs upward of 24,000 men.

The Standard Chain Company, Bailey-Farrell Building, Pittsburgh, Pa., has been awarded a contract by the Third Lighthouse Department, Tompkinsville, Ga., for 570,000 lb. of 1⅝-in. chain for light vessels to Government specifications, the iron for which is being rolled in its own mills at Columbus, Ohio. The Standard Chain Company demonstrated to the department that it can exceed the specifications in every requirement, although extremely severe as to elastic limit, elongation, contraction of area and cold bend tests.

An Analysis of Boiler Feed Records

How the Copes Boiler Feed Regulator Helps to Prevent Fluctuations in Water Level

The installation of recording instruments in power boiler plants provides an excellent means for determining the efficiency of the boiler, the feed water heater, the economizer and the other auxiliaries. The graphical records obtained from these instruments are very valuable in determining the efficiency and reliability of boiler feed regulators. Venturi meter records also serve as an absolute check on the rate of feed and the reliability and efficiency of the regulator. The charts and records which are reproduced were obtained in large boiler plants, and an analysis of them tends to show the value of a boiler feed regulator in economical operation of the boiler room, and shows some of the results secured by the use of the Copes boiler feed regulator, which is manufactured by the Northern Equipment Company, Chicago, Ill.

In recently visiting a large boiler plant where careful records of temperatures, coal consumption, steam pressure, load, &c., are kept it was noticed that in 15 different boilers the water level varied from no water in the glass to 1 in. from the top of a 16-in. gauge glass, and an hour later the range was from 1 in. from the bottom to 3 in. from the top of the gauge glass. Using a properly constructed automatic boiler feed regulator would have maintained these water levels within a fraction of an inch of the normal hight and regardless of the load, the rate of feed to each boiler would have been in proportion to the rate of evaporation. It would thus have been possible not only to avert burning out and straining the tubes from low water, as well as excess moisture in the steam because of high water, but numerous other economies would also have resulted. The use of automatic regulators, which feed in proportion to the rate of evaporation, eliminates labor, smooths out the operation of the boiler room and results in securing very high temperature for the boiler feed water.

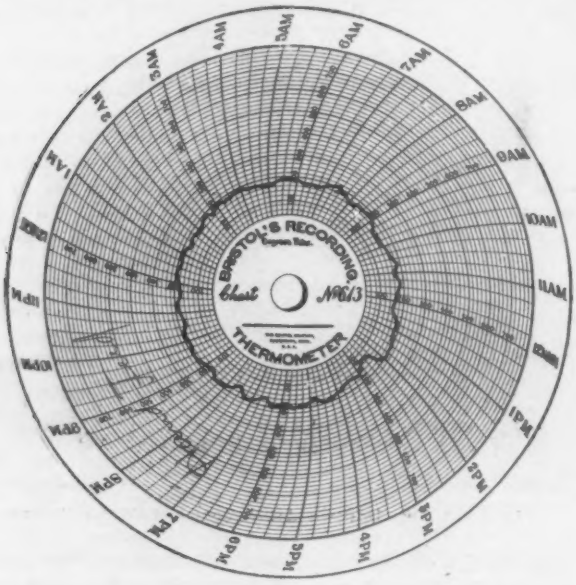


Fig. 1.

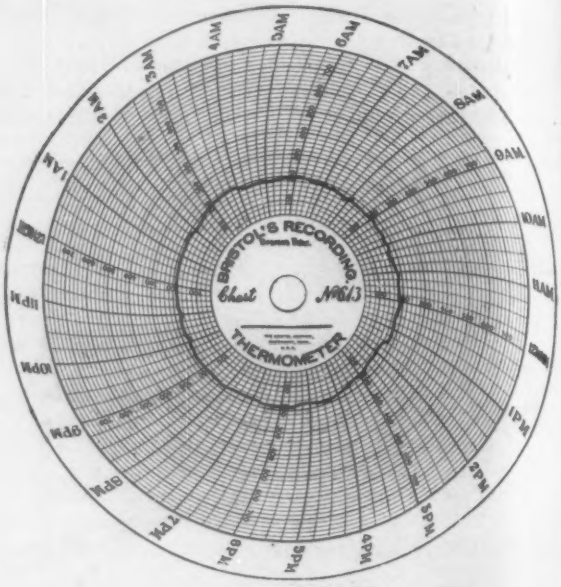


Fig. 2.

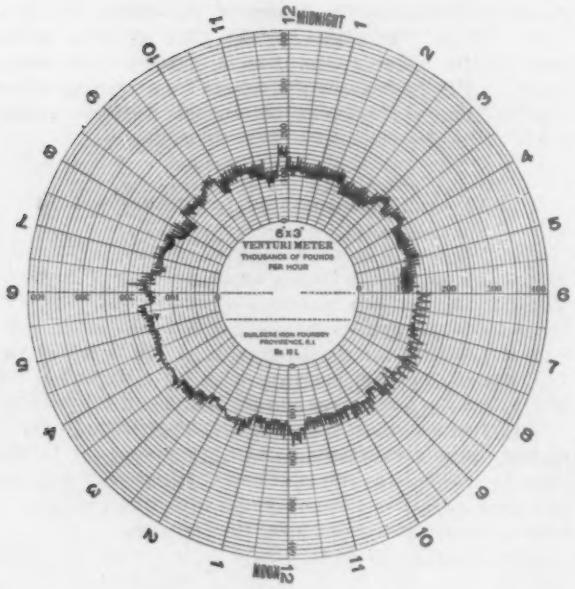


Fig. 3.

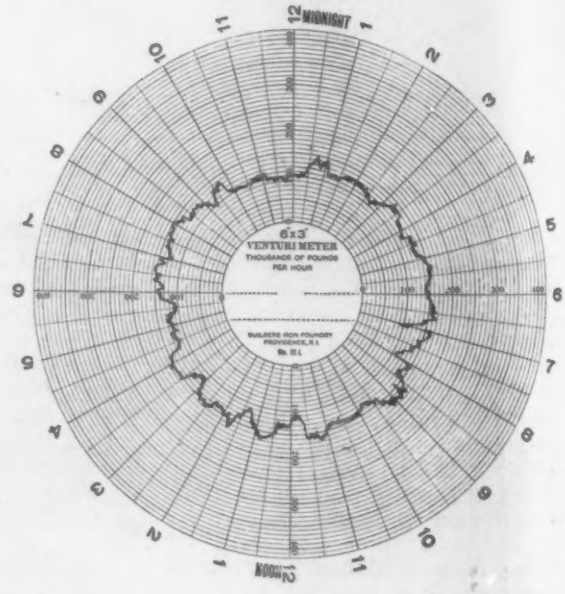


Fig. 4.

Charts Showing How Variations in the Temperature and Quantity of Boiler Feed Water Are Reduced by the Copes Boiler Feed Regulator.

Figs. 1 and 2 show the importance of proper feed water regulation with regard to feed water temperature, the former being taken in a plant equipped with an open feed water heater, from which the supply of feed water was drawn and fed to the boiler by hand. In the case of Fig. 2 an automatic boiler feed regulator was used and the effect of feeding in exact proportion to the rate of evaporation is clearly shown in the constant high temperature of the feed water. This is explained by the fact that in addition to the feed being in proportion to the rate of evaporation it is also in proportion to the load on the boiler and the entire plant, and consequently in proportion to the rate at which exhaust steam is supplied to the open heater from the auxiliaries.

In the earlier type of boiler feed regulator the op-

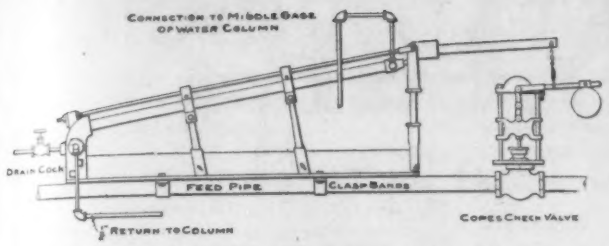


Fig. 5.—The Copes Boiler Feed Regulator Made by the Northern Equipment Company, Chicago, Ill.

erating element was a float, which rested upon the surface of the water in the boiler and opened or closed a feed valve through a system of levers, its motion corresponding to the changes in the water level. This same principle is used at the present time in many regulators with special adaptations in the form of pilot valves and diaphragms, or the use of electro-magnetic control to operate the valve in the supply line, due to changes in water level, an arrangement which is sluggish and unsatisfactory for high rates of evaporation. This is due to the fact that on account of its weight there must be a considerable change in water level before the additional water displaced by the float can cause it to rise, a condition which is also complicated by the resistance of the levers connecting the float with the pilot valve. In this way it is possible that the water level in the boiler may rise several inches before the pilot valve is closed and the supply of feed water stopped.

This action can probably be best understood by comparing Figs. 3 and 4, which are Venturi meter charts of the water supplied to a large boiler. The first chart was taken when the boiler was equipped with a regulator operating on the float and pilot valve principle, while the

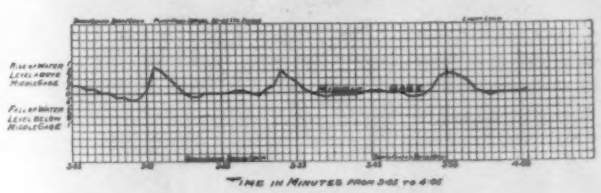


Fig. 6.—Diagram Showing Variation in Water Level of a 400-Hp. Boiler.

latter was taken from the same boiler when the regulator had been changed to one of the Copes automatic boiler feed regulators, which is shown in Fig. 5. It will be noticed in Fig. 3 that the rate of feed for 24 hours fluctuates in a very spasmodic manner, while that in Fig. 4 is smooth and nonfluctuating, varying in accordance with the load on the boiler plant.

As will be noticed from Fig. 5 the feed valve consists of an ordinary check valve connected by a system of levers to a long tube, which expands and contracts in accordance with changes in temperature that in their turn depend upon the hight of the water level in the boilers. This long tube is known as the expansion tube, and connected to its top is a smaller tube running to the middle of the water column. The bottom of the expansion tube is connected to the drain pipe at the bottom of the water column by a small tube. When the water in

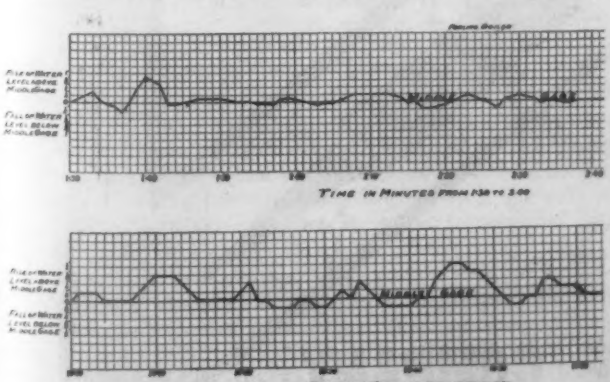


Fig. 7.—Chart Giving Readings of Water Level in a Lighting Plant Boiler.

the boiler is above the normal point the expansion tube is filled with water which circulates slowly, and as the heat is radiated its temperature and that of the tube containing it falls, thus causing contraction and forcing the feed valve to close. When the water level is below normal steam flows into the expansion tube and maintains its temperature at that of the steam regardless of the amount of radiation. This occurs because as soon as any steam is condensed to supply the heat lost by radiation more steam flows into the tube to take its place, and consequently the steam filled tube expands and allows the check valve in the feed line to open and admit water to the boiler. With a constant boiler load water and steam would alternately flow through the expansion tube, thus maintaining the temperature at a mean point. The length of the expansion tube is also a mean and the check valve in the feed line opens far enough to supply water to the boiler in proportion to the rate of evaporation. Increasing the load on the boiler causes the water level to fall as the feed valve is not opened far enough to meet the increased rate of evaporation, and this fall in water level reduces the amount of water flowing through the expansion tube, and increases the supply of steam, with the result that the expansion tube causes the check valve to open further and increases the rate of feed.

The expansion tube shown in Fig. 5 is of the maker's special construction and is designed for very heavy service. The braces are heavy and prevent any lateral or longitudinal strains or distortion, and the metal used in the construction of the tube combines a high coefficient of expansion with a high compressive strength. No large load, however, comes upon the tube, as the work of closing the feed valve is accomplished by a toggle motion and weighted lever attached to the valve bonnet, the only actual work performed by the expansion of the tube being to lift this small weight against gravity. Contraction of the expansion tube, due to the rise of the water level in the boiler, causes the weight to fall and close the feed valve through the toggle lever.

The accuracy with which it is possible to maintain a constant water level by an expansion tube boiler feed regulator is shown in Figs. 6 and 7. Fig. 6 is a series of gauge readings obtained in the plant of the South Side Elevated Railroad Company, Chicago, Ill., and it will be noticed that although the load on the 400-hp. boiler fluctuated considerably, running as high as 511 hp. in one instance, the water in the boilers remained within less than an inch of the middle gauge. Fig. 7 shows a series of similar readings obtained at the plant of the St. Joseph Railway, Light & Power Company, which were taken on a large boiler equipped with automatic stokers. In this instance the load was considerably above the rated capacity of the boiler, and was especially so around 2:30, a circumstance which was not shown by the difference in water level at that time, and, in fact, throughout the whole period the maximum change in level was less than 1 in. In the lower chart the readings were obtained while the boilers were operating under a light load and the doors alternately opened and closed. An inspection of the chart fails to reveal any appreciable difference in the water level.

The report of the Tennessee Coal, Iron & Railroad Company's earnings, recently filed with the New York Stock Exchange in connection with the listing of additional bonds, showed that for the 10 months ended October 31, 1910, the balance of earnings and income after depreciation and interest charges was $2,028,258. The surplus added to the $1,555,845 surplus of December 31, 1909, was $3,498,392. In 1907 the net profits after allowances for depreciation and extraordinary replacements and $855,552 in net interest charges on bonded and floating debt were $1,426,684.

The Swedish Government recently asked bids on 20,000 tons of rails for the state railroads. Two firms, both British, responded, but the lowest bid £5 18s. 2d., was considered too high and the award has been postponed awaiting a lower price. The last purchase was made from the German Steel Syndicate at the equivalent of £5 13s.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:

1 to 1⅜ in. round and square ... ₱ lb 1.75¢
1½ to 4 in. x ⅜ to 1 in. ... ₱ lb 1.85¢
1½ to 4 in. x ¼ to 3-4 ... ₱ lb 1.85¢
Rods—⅜ and 11-16 round and square ... ₱ lb 1.85¢

Angles:	Cts ₱ lb
3 in. x ¼ in. and larger	2.00¢
3 in. x 3-16 in. and ⅛ in.	2.25¢
1½ to 2½ in. x ¼ in.	2.10¢
1½ to 2½ in. x 3-16 in. and thicker	2.10¢
1 to 1¼ in. x 3-16 in.	2.10¢
1 to 1¼ x ⅛ in.	2.30¢
⅞ x ⅛ in.	2.40¢
¾ x ⅛ in.	3.45¢
⅝ x ⅛ in.	4.25¢
½ x 3-32 in.	

Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ x ¼ in.	2.15¢
1½ to 2½ x 3-16 in.	2.35¢
3 in. and larger	2.05¢
Beams	2.00¢
Channels, 3 in. and larger	2.00¢
Bands—1½ to 6 x 3-16 to No. 8	2.30¢
"Burden's Best" Iron, base price	3.15¢
Burden's "H. B. & S." Iron, base price	2.95¢
Norway Bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	1.90¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black	One Pass, C.R Soft Steel.	R. G. Cleaned.
No. 16	₱ lb 2.55¢	2.80¢
Nos. 18 to 20	₱ lb 2.70¢	2.90¢
Nos. 22 and 24	₱ lb 2.75¢	3.00¢
No. 26	₱ lb 2.80¢	3.10¢
No. 28	₱ lb 2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ... ₱ lb 12 @14½
Patent Planished, W. Dewees Wood ... ₱ lb A, 10¢; B, 9¢ net.

Galvanized.

Nos. 12 and 14	₱ lb 2.95¢
Nos. 22 to 24	₱ lb 3.30¢
No. 26	₱ lb 3.50¢
No. 28	₱ lb 3.80¢

No. 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized.

Nos. 22 and 24	₱ lb 5.75¢
No. 26	₱ lb 6.25¢
No. 28	₱ lb 7.25¢

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd
No. 24 ... ₱ 100 sq. ft.	$3.85	4.80
No. 26 ... ₱ 100 sq. ft.	2.95	4.00
No. 28 ... ₱ 100 sq. ft.	2.60	3.75

Tin Plates—

American Charcoal Plates (per box.)

"A.A.A." Charcoal:
IC, 14 x 20 ... $6.35
IX, 14 x 20 ... 7.60
A. Charcoal:
IC, 14 x 20 ... $5.40
IX, 14 x 20 ... 6.50

American Coke Plates—Bessemer—
IC, 14 x 20 ... 107 lb ... $4.40
IX, 14 x 20 ... 5.40

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating ... $8.50
IX, 20 x 28 with an 8 lb. coating ... 10.50

Seamless Brass Tubes—

List November 11 1908. Base price 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13. 1908. Base price 18¢

Copper Tubes—

List November 13. 1908. Base price 21¢

Brazed Brass Tubes—

List August 1, 1908. 19½¢ ₱ lb

High Brass Rods—

List August 1, 1908. 14½¢ ₱ lb

Roll and Sheet Brass—

List August 1, 1908. 14½¢ ₱ lb

Brass Wire—

List August 1, 1908. 14½¢ ₱ lb

Copper Wire—

Base Price. Carload lots mill 14½¢

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz (quantity lots) ₱ lb 18 ¢
Sheet Copper Cold Rolled, 1¢ ₱ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1¢ ₱ square foot.
Sheet Copper Polished over 20 in. wide, 2¢ ₱ square foot.
Planished Copper, 1¢ ₱ square foot more than Polished.

METALS—

Tin—

Straits Pig ... ₱ lb 40¼@40½¢

Copper—

Lake Ingot ... ₱ lb 14¾@15 ¢
Electrolytic ... ₱ lb 14¾@14⅞¢
Casting ... ₱ lb 14¼@14⅜¢

Spelter—

Western ... ₱ lb 6 @6¼¢

Zinc.

No 9, base, casks ... ₱ lb 6 ¢ | Open ... ₱ lb 6¼¢

Lead.

American Pig ... ₱ lb 5 @5¼¢
Bar ... ₱ lb 6¾@6¾¢

Solder.

½ & ½, guaranteed ... ₱ lb 23½@24 ¢
No. 1 ... ₱ lb 21½@22 ¢
Refined ... ₱ lb 19 @19½¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₱ lb ...@10¢
Hallett's ... @9¢
Other Brands ... @8½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in Ingot for remelting ... 24¢
Rods & Wire ... Base Price 31¢
Sheets ... Base Price 33¢

Old Metals.

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, Heavy cut and crucible ... ₱ lb	11.00@11.25
Copper, Heavy and Wire ... ₱ lb	10.75@11.00
Copper, Light and Bottoms ... ₱ lb	9.75@10.00
Brass, Heavy ... ₱ lb	7.25@ 7.50
Brass, Light ... ₱ lb	5.75@ 6.00
Heavy Mechine Composition ... ₱ lb	9.75@10.00
Clean Brass Turnings ... ₱ lb	7.25@ 7.50
Composition Turnings ... ₱ lb	8.25@ 8.50
Lead, Heavy ... ₱ lb	...@ 3.75
Lead, Tea ... ₱ lb	...@ 3.50
Zinc Scrap ... ₱ lb	...@ 4.00

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